U.S Department of the Interior
Bureau of Land Management

Previously Issued Oil and Gas Leases in the White River National Forest Draft Environmental Impact Statement

Volume I – Cover through Chapter 3.0

November 2015

BLM/CO/PL-16/002

BLM

Colorado River Valley Field Office, Colorado

BLM Mission Statement

The Bureau of Land Management is responsible for stewardship of our public lands. The BLM is committed to manage, protect and improve these lands in a manner to serve the needs of the American people. Management is based upon the principles of multiple use and sustained yield of our nation's resources within a framework of environmental responsibility and scientific technology. These resources include recreation, rangelands, timber, minerals, watershed, fish and wildlife habitat, wilderness, air and scenic quality, as well as scientific and cultural values.

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Colorado River Valley Field Office
2300 River Frontage Road
Silt, Colorado 81652
(970) 876-9000 /

In Reply Refer To:
(CON040)

NOV 18 2015

October 23, 2015

Dear Reader:

Enclosed for your review and comment is the Draft Environmental Impact Statements (EIS) for Previously Issued Oil and Gas Leases in the White River National Forest. The Draft EIS evaluates the environmental impacts that would result from cancelling, reaffirming or modifying (with additional or different terms) 65 previously issued federal fluid minerals leases underlying White River National Forest (WRNF) lands in western Colorado. These leases were issued between 1995 and 2012, and are located in Mesa, Garfield, Pitkin and Rio Blanco counties, between the towns of De Beque and Carbondale south of Interstate 70, except for one lease northeast of Meeker. In 2007, the Interior Board of Land Appeals (IBLA) ruled that before including U.S. Forest Service parcels in an oil and gas lease sale, the Bureau of Land Management (BLM) must either formally adopt National Environmental Policy Act (NEPA) analysis completed by the U. S. Forest Service or conduct a NEPA analysis of its own. The BLM determined that the U.S. Forest Service NEPA analysis conducted for the 65 previously issued leases is no longer adequate due to changes in laws, regulations, policies and conditions since the earlier EIS was finalized in 1993. Therefore, the BLM has evaluated and disclosed the potential impacts of a range of management decisions for these lease parcels and the associated reasonably foreseeable oil and gas development through this EIS in compliance with NEPA and associated regulations.

The alternatives analyzed in the Draft EIS were developed by the BLM in response to issues and concerns raised through public comments, coordination with Cooperating Agencies, and interaction with BLM management and resource specialists. The alternatives are briefly described below.

- Alternative 1 (the No Action Alternative), which would reaffirm the 65 leases as they were issued.
- Alternative 2, under which the BLM would modify eight of the leases to address inconsistencies by adding stipulations identified in the 1993 EIS and Record of Decision (ROD) that were not attached to the leases as issued.
- Alternative 3, which would modify each of the 65 leases to match the stipulations for future leasing identified in the Proposed Action from the 2014 WRNF Oil and Gas Leasing Final EIS.
- Alternative 4 (the Proposed Action), which would both modify and cancel leases. In areas identified as open to future leasing by the U.S. Forest Service's 2014 draft ROD for Oil and Gas Leasing on Lands Administered by the White River National Forest, lease stipulations would be modified as in Alternative 3. All or part of 25 leases would be cancelled in areas identified in the draft ROD as closed to future leasing.

- Alternative 5, under which BLM would cancel all of the previously issued 65 leases, plug and abandon all producing wells, remove infrastructure, and reclaim well pads and other ancillary facilities.

Leasing, by itself, would not directly impact most resources, but given that subsequent development of the leases is a reasonably foreseeable result of a lease right to extract federal minerals, the impact analysis presented in the Draft EIS considers the potential impacts of reasonably foreseeable future development. The basis for the analysis of future oil and gas development is the Reasonably Foreseeable Development Scenario (RFDS) for Oil and Gas Activities on the WRNF, which has been scaled to the amount of development foreseeable under each alternative.

The Draft EIS will be available for a 45-day public comment period. Persons wishing to provide the BLM with comments on the Draft EIS should submit written comments to:

WRNF Leases EIS
C/O Greg Larson, Project Manager
BLM Colorado River Valley Field Office
2300 River Frontage Road
Silt CO 81652

Comments may also be faxed to WRNF Leases EIS, C/O Greg Larson at (970) 876-9090 or submitted electronically at: WRNFleases@blm.gov. Comments will be accepted for forty five (45) calendar days following the U.S. Environmental Protection Agency's publication of its Notice of Availability in the *Federal Register*. The BLM can best utilize your comments and resource information if received within the review period. Please make your comments as specific as possible.

Before including your address, phone number, email address or other personal identifying information in your comment, be advised that your entire comment-including your personal identifying information may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

Meetings on the Draft EIS will be held at a time and date to be determined. The purpose of the meetings will be to give the public an opportunity to discuss and comment on the Draft EIS. Written comments will also be accepted at the open house meetings. Meetings and any other public involvement activities will be announced at least 15 days in advance through public notices, media news releases or mailings.

Copies of the Draft EIS are available in the BLM Colorado River Valley Field Office, 2300 River Frontage Road, Silt, Colorado, 81652. Project materials may be viewed at the Colorado River Valley Field Office at the address indicated above during regular business hours (8:00 a.m. to 4:30 p.m.), Monday through Friday, except holidays.

The Draft EIS is also available online at:
http://www.blm.gov/co/st/en/fo/crvfo/existing_leases_on.html.

If you would like additional information not found on the project website, please contact Greg Larson, Project Manager, at (970) 876-9000.

Sincerely,

Ruth Welch
State Director
BLM Colorado

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Draft Environmental Impact Statement for Previously Issued Oil and Gas Leases on the White River National Forest

November 2015

Lead Agency:	U.S. Department of the Interior, Bureau of Land Management, Colorado River Valley Field Office
Cooperating Agencies:	U.S. Environmental Protection Agency Region 8, Colorado Division of Natural Resources, Colorado Parks and Wildlife, U.S. Forest Service (White River National Forest), Garfield County, Mesa County, Pitkin County, Rio Blanco County, City of Glenwood Springs, City of Rifle, Town of Carbondale, Town of New Castle, Town of Parachute, Town of Silt
Project Location:	Mesa, Garfield, Pitkin, and Rio Blanco counties, Colorado
Comments on the Draft EIS:	Attn: WRNF Leases BLM Colorado River Valley Field Office 2300 River Frontage Road Silt, CO 81652 Telephone: (970) 876-9000 FAX: (970) 876-9090 Email: WRNFleases@blm.gov
Further Information on the Draft EIS:	Greg Larson, Project Manager Telephone: (970) 876-9000
Date Draft EIS Notice of Availability Published in Federal Register:	November 20, 2015
Date by Which Comments Must be Received by the BLM:	January 8, 2016
BLM Authorized Officer Responsible for Preparing the Draft EIS:	Karl Mendonca, Field Manager

ABSTRACT

This Draft Environmental Impact Statement (EIS) has been prepared to document and disclose the environmental impacts of reaffirming, modifying, or cancelling 65 previously issues federal fluid minerals leases underlying White River National Forest (WRNF) lands. These leases were issued between 1995 and 2012, and are located in Mesa, Garfield, Pitkin, and Rio Blanco counties. The Forest Service decision that made the 65 parcels considered in this EIS available for oil and gas leasing was documented through the 1993 WRNF Oil and Gas Leasing Record of Decision and reaffirmed in the 2002 White River National Forest Plan. In 2007, in a challenge brought against the issuance of some of the 65 leases at issue here, the Interior Board of Land Appeals (IBLA) held that before including Forest Service parcels in an oil and gas lease sale the BLM must either formally adopt NEPA analysis completed by the Forest Service or conduct a NEPA analysis of its own (see Board of Commissioners of Pitkin County, 173 IBLA 173 [2007]). With respect to the leases at issue, the IBLA ruled that although the BLM was a cooperating agency on

the 1993 WRNF Oil and Gas Leasing EIS, the BLM did not formally adopt the Forest Service NEPA analysis, and therefore did not comply with its NEPA obligations with respect to the issuance of those leases. Following the IBLA's decision, the BLM determined that the WRNF NEPA analysis conducted for the 65 previously issued leases is no longer adequate due to changes in laws, regulations, policies, and conditions since the earlier EIS was finalized in 1993.

The Draft EIS discusses the purpose and need for the Proposed Action; alternatives to the Proposed Action; and potential direct, indirect, and cumulative impacts of each alternative. The potential impacts of each alternative are analyzed by using adjusted Reasonable Foreseeable Development Scenario estimates. Five alternatives are analyzed in detail in the DEIS:

1. Alternative 1: Reaffirms all 65 leases (No Action)
2. Alternative 2: Reaffirms 57 leases and addresses lease inconsistencies on 8 leases
3. Alternative 3: Modifies leases to match stipulations identified in the Proposed Action for the Final EIS for Future Oil and Gas Leasing on the WRNF (2014)
4. Alternative 4: Modifies or cancels leases to match the stipulations and availability decisions of the Draft ROD for Future Oil and Gas Leasing on the WRNF (2014) (Proposed Action)
5. Alternative 5: Cancels all leases; plug and abandon all existing wells

These alternatives were developed by the BLM in response to issues and concerns from public comments submitted during the public scoping period, coordination with Cooperating Agencies, and interaction between BLM management and resource specialists. The BLM also considered alternatives raised during the scoping and alternatives development processes that are not carried forward for detailed analysis.

Comments on the Draft EIS will be accepted for 45 days from publication of the Notice of Availability (NOA) in the Federal Register.

Executive Summary

ES.1 Introduction

In compliance with the National Environmental Policy Act of 1969, as amended (NEPA), the Bureau of Land Management (BLM) Colorado River Valley Field Office in Silt, Colorado, has prepared this Environmental Impact Statement (EIS) to analyze the potential impacts of cancelling, reaffirming, or modifying (with additional or different terms) 65 federal fluid minerals leases within the White River National Forest (WRNF). These leases were issued between 1995 and 2012, and are located in Mesa, Garfield, Pitkin, and Rio Blanco counties, between the towns of De Beque and Carbondale south of Interstate 70, except for one lease northeast of Meeker (see **Figure ES-1**).

In 2007, the Interior Board of Land Appeals (IBLA) held that before including Forest Service parcels in an oil and gas lease sale the BLM must either formally adopt NEPA analysis completed by the Forest Service or conduct a NEPA analysis of its own (see Board of Commissioners of Pitkin County, 173 IBLA 173 [2007]). The IBLA ruled that although the BLM was a cooperating agency on the Forest Service's 1993 WRNF Oil and Gas Leasing EIS, the BLM did not formally adopt the Forest Service NEPA analysis or prepare its own analysis, and therefore did not comply with its NEPA obligations with respect to the issuance of those leases at issue in that proceeding. While the 2007 IBLA decision only specifically addressed 4 of the previously issued leases, all the remaining 65 leases are in the same procedural posture with respect to issuance.

Following the IBLA's decision, the BLM determined that the Forest Service NEPA analysis conducted for the previously issued leases is no longer adequate due to changes in laws, regulations, policies, and conditions since the Forest Service's EIS was issued in 1993. Therefore, this EIS evaluates and discloses the potential impacts of leasing those parcels. It does not address future fluid mineral leasing availability, which has recently been addressed in a separate NEPA analysis prepared by the Forest Service, the WRNF Oil and Gas Leasing Final EIS (December 2014). The BLM has incorporated as much of the Forest Service's new NEPA analysis related to future oil and gas leasing on the WRNF as possible into this analysis. The BLM was a cooperating agency on the 2014 WNRF EIS.

ES.2 Reasonably Foreseeable Development Scenario

For purposes of this analysis, the BLM needed to prepare a Reasonably Foreseeable Development Scenario (RFDS) of potential oil and gas leasing activity within the analysis area. A RFDS is a long-term projection of the likely potential future oil and gas development and production within a defined area and a defined period of time (20 years). An RFDS for the WRNF was prepared by the Forest Service in connection with the Forest Service's recent analysis of future leasing. That analysis was published in September 2010, and was included as Appendix F in the WRNF Oil and Gas Leasing Draft EIS (U.S. Forest Service [USFS] 2012).

As stated in the RFDS (USFS 2010a), its purpose is to provide an estimated projection of unconstrained, future oil and gas exploration and development based on a set of assumptions in order "to evaluate potential effects that might reasonably occur as a result of leasing." The RFDS is based on geology; resource occurrence potential; past and current leasing, exploration, and development activity; and engineering technology, with consideration of economics and physical limitations on access to resources. An RFDS is not a decision, and it does not establish or imply a limit on future development.

The RFDS (USFS 2010a) was used as a starting point for estimating the number of wells likely to be developed within the 65 previously issued leases. The basic assumptions used to develop the estimated unconstrained oil and gas development within the 65 leases are summarized below.

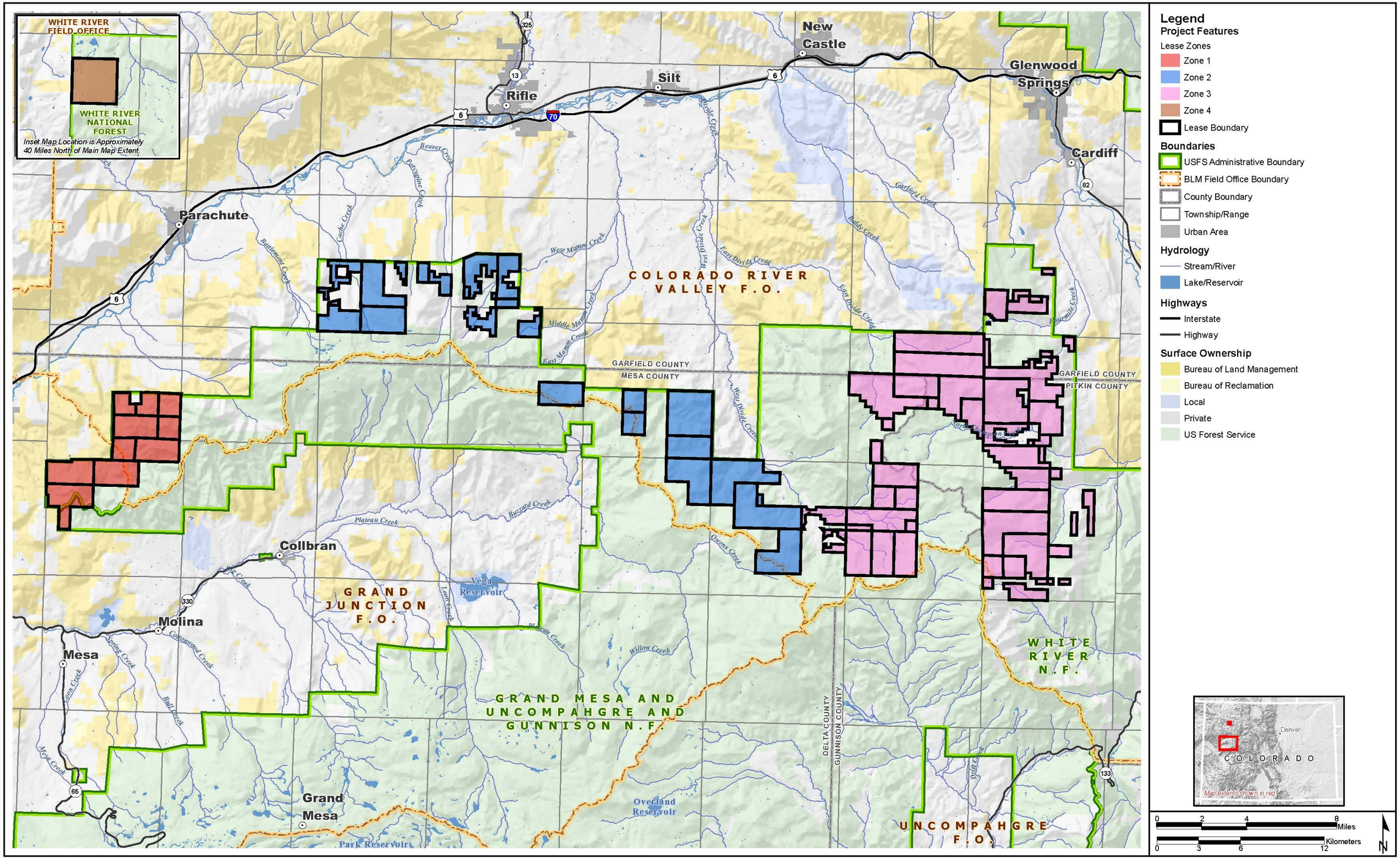
- At least one well can be reasonably foreseen for each of the 65 leases.
- Future development will follow past development trends.
- Almost 4 percent of all wells will be horizontally drilled.
- A total of 444 wells is projected within the 65 leases without taking into account constraints such as No Surface Occupancy (NSO) stipulations.
- The 444 wells would not be evenly distributed across the 65 leases. Rather, the leases have been grouped spatially into zones based on the location of past development, production infrastructure, and access for exploration and production.

ES.3 Standard Lease Terms and Lease Stipulations

Standard Lease Terms establish that the lessee has the right to use as much of the leased lands as is necessary to explore, drill, and extract all the leased resource. Standard Lease Terms allow for reasonable measures that may be required to minimize adverse impacts to other resource values, land uses, or land users to the extent consistent with the lease rights granted. Lease stipulations are conditions placed on a lease that become part of the lease issued by BLM. The purpose of lease stipulations is to minimize potential adverse impacts of exploration and development operations in compliance with applicable management direction. Additional information related to lease stipulations and the specific stipulations considered by the Forest Service to meet the standards and guidelines of the WRNF Forest Plan (USFS 2002b) can be found in Section 1.4.6 of the WRNF Oil and Gas Leasing Final EIS (USFS 2014a). The types of lease stipulations applied and analyzed in this EIS include the following.

- **No Surface Occupancy (NSO)**—Prohibits all surface activities and intended for use only when other stipulations are determined to be inadequate to protect surface resources, especially where the resource protection cannot be accomplished by relocating proposed operations less than 200 meters (approximately 660 feet).
- **Controlled Surface Use (CSU)**—Controls lease activities where resource protection cannot be accomplished adequately with mitigation measures provided by standard lease terms, regulations, and other guidance. It is less restrictive than NSO and applied where use and occupancy is allowed but special operational constraints are needed for specific types of activities without prohibiting all surface activities.
- **Timing Limitations (TL)**—Prohibits surface use during a specified period to protect identified resources and resource values on a seasonal basis.

Exceptions, modifications, or waivers may be issued on a case-by-case basis to exempt the lessee from NSO, CSU, or TL stipulations temporarily or permanently (for the life of the lease) if the conditions under which the stipulation was establish do not exist. Modifications and waivers are defined at 43 CFR 3101.1-4.



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Date: 9/17/2015

Figure ES-1 General Location of Leases to be Evaluated

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ES.4 Purpose and Need; Decisions to Be Made

ES.4.1 Purpose of the Action

BLM's purpose for this federal leasing action is to:

- Revisit or reaffirm previous BLM decisions to issue 65 leases underlying Forest Service lands. These leases were issued from 1995 to 2012 following the Forest Service's availability decision considered in the 1993 EIS;
- Assess conformance with the decisions making these lands available for oil and gas leasing in the 1993 EIS, as reaffirmed in the 2002 White River National Forest Plan and consider consistency with the Forest Service's recent availability decisions for lands within the White River National Forest;
- Support the Forest Service in managing oil and gas resources, as required by law and memoranda of understanding between the agencies; and
- Fulfill the federal government's policy to "foster and encourage private enterprise in the development of economically sound and stable industries, and in the orderly and economic development of domestic resources to help assure satisfaction of industrial, security, and environmental needs" (Mining and Minerals Policy Act of 1970) while continuing to sustain the land's productivity for other uses and capability to support biodiversity goals (USFS Minerals Program Policy).

ES.4.2 Need for the Action

The BLM's need for this federal leasing action is to:

- Meet domestic energy needs under the requirements of the Mineral Leasing Act of 1920, as amended, the Mining and Minerals Policy Act of 1970, and the Federal Onshore Oil and Gas Leasing Reform Act of 1987 ("Reform Act"). The BLM's responsibility under these laws is to regulate the development of oil and gas in the public domain, and to ensure that deposits of oil and gas owned by the United States shall be subject to disposition through the land use planning process.
- Address the NEPA deficiency identified by the 2007 IBLA ruling on the appeal by the Board of Commissioners of Pitkin County that BLM must formally adopt NEPA analysis completed by the Forest Service or conduct a NEPA analysis of its own for issuance of oil and gas leases underlying WRNF lands;
- Support USFS mineral policy that puts responsibility on field units, with the known presence or potential presence of a mineral or energy resource, to foster and encourage the exploration, development, and production of the mineral or energy resource consistent with Forest Service management direction; and
- Meet BLM's collaborative responsibility under the Reform Act to issue and manage oil and gas leases where the USFS has issued a land availability decision.

ES.5 Decisions to be Made

ES.5.1 Decisions to Be Informed Through This Analysis

This EIS considers 65 previously issued leases issued in the WRNF that were issued between 1995 and 2012. The decision to be made by the BLM, based on the analysis in this EIS, is whether some or all of the 65 leases should be:

1. Reaffirmed with their current existing stipulations;
2. Modified with additional or different lease terms or additional mitigation measures; or
3. Cancelled.

ES.5.2 Decisions Beyond the Scope of This Analysis

The decision of whether National Forest System lands are available or unavailable for oil and gas leasing remains with the Forest Service, although the BLM retains the ultimate discretion whether to issue a lease (43 CFR 3101.7-2). In light of this, the BLM will only consider the currently leased parcels issued without BLM NEPA analysis (65 parcels) and not future leasing availability within the WRNF, which is being addressed by the Forest Service separately. In addition, this EIS will not directly affect decisions on any pending or proposed Application for Permit to Drill because the Forest Service has the authority to address the NEPA on the proposed Surface Use Plans of Operations that accompany each Application for Permit to Drill.

This is strictly a leasing decision and will not authorize any development on these previously issued leases. Any discussion of development in this EIS is only to facilitate an analysis of the effects of leasing through analysis assumptions based on historic oil and gas development in this region and the 2010 RFDS.

ES.6 Scoping, Public Involvement, and Relevant Issues Identified

ES.6.1 Public Scoping Issues

In early 2014, the BLM held a public scoping period for the project. Substantive scoping comments fell into the following four broad categories: Process, Purpose and Need, Alternatives Development, and Impacts Analysis (including resource-specific concerns and cumulative impacts). The primary public scoping issues are summarized in **Table ES-1** with the locations in this EIS where they are addressed.

ES.6.2 Internal Scoping

Following review of the public scoping comments, the BLM Colorado River Valley Field Office interdisciplinary team met to discuss the external scoping comments and to formulate alternatives to be analyzed in the EIS. This meeting was held to identify issues of concern to the BLM and to discuss how to address the public and agency issues in the EIS. The meeting also helped to more fully develop the conceptual alternatives that were presented in the Notice of Intent.

Table ES-1 Summary of Primary Scoping Comments

Resource	Primary Scoping Comments	Where Issues Are Analyzed in EIS
Process	What NEPA deficiencies exist and by what process should the BLM address them? By what authority may the BLM cancel or modify leases?	Sections 1.2 — 1.5
	How can cooperators, affected stakeholders, and other interested parties participate during the NEPA process?	Section 1.7, Chapter 5.0
Purpose and Need	Should the Purpose and Need for agency action extend beyond addressing a NEPA deficiency?	Sections 1.2, 1.3
	What are BLM's and USFS's respective roles and decisions to be made?	Section 1.4
Analysis Approach (General)	What RFDS and other development assumptions should be used for EIS analysis? What level of analysis is appropriate for a lease sale EIS?	Section 4.1
	How should the BLM address changed circumstances and new information in a remedial NEPA process?	Chapter 1.0; Chapter 2.0; Section 4.1
Cumulative Impacts	What reasonably foreseeable future actions are appropriate for inclusion in the cumulative impact analyses?	Section 4.1
Air Quality	How would reasonably foreseeable development activities such as drilling, production, vehicle use, and other sources affect air quality?	Section 4.2
	How will the Proposed Action and alternatives address emissions of greenhouse gasses and potential contributions to climate change?	Section 4.2
Geology and Minerals, including Paleontology	What is the potential for seismic activity or other geological instability as a result of reasonably foreseeable development?	Section 4.3
	How would the potential for gas and liquid migration or seismic activity be affected by Mancos shale drilling, hydraulic fracturing, injection of produced water, or other reasonably foreseeable activities?	Sections 4.3, 4.5
	What is the potential for impacts to important paleontological resources from reasonably foreseeable development?	Section 4.3
Soils	How does area soil type affect the potential for erosion, runoff, and subsequent sediment loading? How will impacts from reasonably foreseeable development to sensitive soils be minimized or mitigated?	Section 4.4
Water Resources	How would the projected water use affect long-term availability of water sources?	Section 4.5
	How would the characteristics of the oil/gas formations, aquifer formations, and their interconnectedness affect water quality during activities such as drilling, hydraulic fracturing, or other reasonably foreseeable activities?	Sections 4.3, 4.5
	What are appropriate setbacks for protection of public and private wells, lakes and streams, impaired waters, floodplains, or other water resources?	Chapter 2.0; Section 4.5
	How can the impacts from spills to water quality and other resources be minimized?	Chapter 2.0; Sections 4.5, 4.16
Vegetation and Special Status Species	How would reasonably foreseeable habitat disturbance affect vegetation resources, plant diversity, and ecologically intact/undisturbed locations and special status plant species?	Chapter 2.0; Section 4.6

Table ES-1 Summary of Primary Scoping Comments

Resource	Primary Scoping Comments	Where Issues Are Analyzed in EIS
Wildlife and Special Status Species	How would reasonably foreseeable habitat disturbance, vehicle use, and other elements of oil and gas development such as noise affect terrestrial and aquatic wildlife, big game, special status species, and their habitat?	Sections 4.6, 4.7, 4.8
Cultural Resources	How can the BLM protect and conserve cultural resources such as Traditional Cultural Properties, from reasonably foreseeable development?	Chapter 2.0; Section 4.9
	How can the setting of historic tourism be maintained in consideration of reasonably foreseeable development?	Sections 4.9, 4.13
Hazardous Materials	What types and amounts of hazardous materials will be used for oil and gas development? What methods will be used for hazardous materials transport, storage, and usage and disposal? What contingencies exist to handle unexpected contaminations?	Section 4.16
Health and Human Safety	How will the BLM protect public health and safety in and around the analysis area? What are the cumulative and combined impacts of multiple exposures to chemicals and toxic substances such as hydraulic fracturing flues, ozone, and volatile organic compounds on humans?	Chapter 2.0; Section 4.16
Land Use	How would the Proposed Action and alternatives comply with federal, county and local policies concerning development?	Section 4.11
Livestock Grazing	How will the BLM minimize impacts to livestock in and around the analysis area from exposure to hydraulic fracturing fluids, fugitive dust, and as well as impacts from noise or traffic?	Section 4.14
Recreation	How would reasonably foreseeable activities affect access to recreation and the quality of the recreational experience? How would this affect the recreation industry?	Sections 4.13, 4.17
Socioeconomics	How would lease reaffirmation, lease modification, and lease cancellation affect local and regional social and economic conditions?	Section 4.17
	Would reasonably foreseeable development be compatible with the varying social and economic conditions across the analysis area?	Section 4.17
Special Designations	How would the Proposed Action and alternatives comply with the 2001 and 2012 Roadless Rules? How would the alternatives affect the wilderness qualities of Inventoried Roadless Areas and the values of Research Natural Areas?	Chapter 2.0; Section 4.12
Transportation	How will development affect local and regional road system, access and traffic? How will adverse impacts to traffic be minimized?	Chapter 2.0; Section 4.10
Visual Resources	How would the reasonably foreseeable development affect the general landscape and rural character of the area under each of the alternatives?	Chapter 2.0; Section 4.15

ES.7 Alternatives

In addition to the No Action Alternative, there are four action alternatives analyzed in detail. The alternatives analyzed were developed by the BLM in response to issues and concerns from public comments submitted during the public scoping period, coordination with Cooperating Agencies, and interaction with BLM management and resource specialists. The BLM also considered alternatives raised during the scoping and alternatives development processes that are not carried forward for detailed analysis.

The alternatives analyzed in detail are briefly described below.

ES.7.1 Alternative 1 (No Action)

Alternative 1 reaffirms the lease stipulations on the 65 leases as they were issued. Under Alternative 1, the BLM would continue to administer the leases with their current stipulations. Those leases that are currently under suspension would be reaffirmed and allowed to be developed at the discretion of the lessee, subject to applicable legal requirements.

ES.7.2 Alternative 2

Alternative 2 modifies 8 existing leases to address inconsistencies with the 1993 EIS and Record of Decision (ROD) by adding stipulations identified in the 1993 EIS and ROD that were not attached to the leases as issued. Under this alternative, the BLM would offer the lessee the option of either accepting the new lease stipulations or having the lease cancelled.

ES.7.3 Alternative 3

Alternative 3 modifies the existing 65 leases to match the stipulations for future leasing identified in the Proposed Action from the WRNF Oil and Gas Leasing Final EIS (USFS 2014a). Although the Forest Service's 2014 Proposed Action (USFS 2014a) does not apply to these 65 leases, Alternative 3 is designed to consider the modification of the 65 leases to match its stipulations for future leasing. Under this alternative, the BLM would offer the lessee the option of either accepting the new lease terms or having the lease cancelled. For undeveloped leases, cancellation (if elected by the lessee) would be done through a BLM administrative process and would require that the BLM refund any bonus bids and lease payments. For leases with producing wells, the new stipulations would only apply to new development. Existing wells would remain in production. Should the lessee not accept the new lease stipulations for future development on a producing lease, it may be necessary for the BLM to request judicial action to cancel the lease.

ES.7.4 Alternative 4 (Proposed Action)

Alternative 4 modifies existing lease stipulations in areas identified as open to future leasing by the Forest Service and cancels all or part of 25 existing leases in areas identified as closed to future leasing. Although the Forest Service's draft decision on future leasing (USFS 2014b) does not apply to these 65 previously issued leases, this alternative is designed to reflect the Forest Service's future management objectives for the areas covered by those 65 leases.. The primary difference between Alternatives 3 and 4 is that under Alternative 4, some leases or parts of leases would be cancelled to match those areas determined to be closed to leasing in the draft decision. In the areas identified as open to future leasing in the WRNF Draft ROD (USFS 2014b), the stipulations would be modified to be the same as those in Alternative 3. Under this alternative, the BLM would offer the lessee the option of either accepting the new lease stipulations or having the lease cancelled. For undeveloped leases, cancellation would be done through a BLM administrative process and would require that the BLM refund any bonus bids and lease payments.

ES.7.5 Alternative 5

Under Alternative 5, all of the previously issued 65 leases would be cancelled. All producing wells would be plugged and abandoned, infrastructure would be removed, roads, well pads, and other ancillary facilities would be reclaimed, and all disturbed areas would be revegetated.

ES.8 Comparison of Reasonably Foreseeable Future Development under the Action Alternatives

The numbers of wells predicted to be developed under each alternative was determined by starting with the unconstrained development from the RFDS (USFS 2010); prorating the well numbers projected for each zone based on past development numbers, production potential, and anticipated drilling technology; and considering the constraints on development, such as NSO stipulations and the maximum distance from the surface location to the target formation. **Table ES-2** displays the estimated number of new wells and pads that are used as the basis for the analysis of effects in Chapter 4.0. Because the predicted number of wells and pads was developed by scaling the RFDS projections, there are fractional numbers for wells and pads. These estimates were used for the development of projected surface disturbance, projected water use, transportation needs, staffing requirements, and production forecasts that are used in the impact analysis.

Table ES-2 Number of Projected Wells by Alternative

Zone (acres in zone) and Development Type	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5[1]
Zone 1 (10,114 acres)					
Vertical/Directional Wells	19.7	19.7	19.7	19.7	0
Horizontal wells	16	16	16	16	
Pads	5.1	5.1	5.1	5.1	0
Zone 2 (24,938 acres)					
Vertical/Directional Wells	318.1	318.1	318.1	318.1	-73
Horizontal wells	1	1	1	1	
Pads	45.6	45.6	45.6	45.6	-13
Zone 3 (42,766 acres)					
Vertical/Directional Wells	50.7	50.7	47.6	17.9	-2
Horizontal wells	1	1	1	0.4	
Pads	7.4	7.4	6.9	2.6	-3
Zone 4 (2,562 acres)					
Vertical/Directional Wells	10	10	10	10	0
Horizontal wells	0	0	0	0	
Pads	1.4	1.4	1.4	1.4	0
Totals (80,380 acres)					
Vertical/Directional Wells	398.4	398.4	395.4	365.7	-75
Horizontal wells	18	18	18	17.4	
Pads	59.5	59.5	59.1	54.7	-16

[1] Under Alternative 5 all leases would be cancelled; therefore, the number of new wells in all zones would be zero. This column displays the numbers of wells and pads to be reclaimed under Alternative 5.

ES.8.1 Comparison of Alternatives

Table ES-3 displays, by alternative, projected surface disturbance (for well pads, roads, and pipelines), as well as projected water use, transportation needs, staffing requirements, and production forecasts for reasonably foreseeable development. The totals shown in the table account for the combination of vertical/directional wells and the number of horizontal wells projected under each alternative. These results are used in the analysis contained in Chapter 4.0.

Table ES-3 Development Assumptions by Alternatives

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5[1]
Zone 1					
Initial Surface Disturbance (acres)	77	77	77	77	0
Long-term Surface Disturbance (acres)	33	33	33	33	0
Fresh Water Use [2] (acre-feet)	339	339	339	339	0
Recycled Water Use (acre-feet)	1,091	1,091	1,091	1,091	0
Gas Production (Bcf)	126	126	126	126	0
Produced Water (gallons)	251	251	251	251	0
Zone 2					
Initial Surface Disturbance (acres)	684	684	684	684	76
Long-term Surface Disturbance (acres)	296	296	296	296	0
Fresh Water Use [2] (acre-feet)	675	675	675	675	0
Recycled Water Use (acre-feet)	1,702	1,702	1,702	1,702	0
Gas Production (Bcf)	388	388	388	388	0
Produced Water (gallons)	1568	1568	1568	1568	0
Zone 3					
Initial Surface Disturbance (acres)	111	111	104	39	10
Long-term Surface Disturbance (acres)	48	48	45	17	0
Fresh Water Use [2] (acre-feet)	123	123	117	44	0
Recycled Water Use (acre-feet)	323	323	307	115	0
Gas Production (Bcf)	67	67	64	24	0
Produced Water (gallons)	258	258	243	91	0
Zone 4					
Initial Surface Disturbance (acres)	21	21	21	21	0
Long-term Surface Disturbance (acres)	9	9	9	9	0
Fresh Water Use [2] (acre-feet)	21	21	21	21	0
Recycled Water Use (acre-feet)	52	52	52	52	0
Gas Production (Bcf)	12	12	12	12	0
Produced Water (gallons)	49	49	49	49	0

Table ES-3 Development Assumptions by Alternatives

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5[1]
Totals					
Initial Surface Disturbance (acres)	893	893	886	821	86
Long-term Surface Disturbance (acres)	386	386	383	355	0
Fresh Water Use [2] (acre-feet)	1,158	1,158	1,152	1,079	0
Recycled Water Use (acre-feet)	3,168	3,168	3,152	2,960	0
Gas Production (Bcf)	593	593	590	550	0
Produced Water (gallons)	2,126	2,126	2,110	1,959	0

[1] Under Alternative 5, all leases would be cancelled; therefore the number of new well in all zones would be zero. The Alternative 5 column displays the surface disturbance due to reclamation of existing wells, pads, and roads.

[2] Includes 20% of completion water (for hydraulic fracturing) that is not recycled.

Notes: Bcf = Billion Cubic Feet

Assumptions used to calculate this information are derived from **Tables 2-5, 2-6**, and **2-7**.

ES.9 Summary of Direct and Indirect Impacts

Leasing, by itself, would not affect most resources with the possible exception of socioeconomics but, given that the probable result of leasing is fluid mineral development, the analysis considers the potential impacts of reasonably foreseeable future development. The basis for the analysis of future oil and gas development is the WRNF RFDS (WRNF 2010), which has been scaled to the amount of development feasible under each alternative (see **Table ES-1**). The impact analyses assume that the environmental protection measures required by Forest Service and BLM policies and guidelines would be successfully implemented. It also assumes that operators and lessees would comply with applicable state and federal regulations and conditions of required permits. In general, the highest potential impacts to surface resources would occur in areas with the most wells and the greatest acreage of associated surface the lowest acreage of restrictive (i.e., NSO, CSU, and TL) stipulations. Under Alternatives 1 and 2, more projected well development would occur and there are fewer restrictive lease stipulations. Alternative 3 has similar levels of development but more restrictive lease stipulations. Alternative 4 has the same lease stipulations as Alternative 3, but somewhat less development due to lease cancellations. Alternative 5, which would cancel all existing leases, would result in minimal acreage of surface disturbance to remove infrastructure and reclaim disturbed areas and the least amount of overall impacts to resources. Detailed descriptions of impacts are presented in each resource section in Chapter 4.0 and summarized in Chapter 2.0, **Table 2-9**. The summarized impacts assume the implementation of laws, regulations, and environmental protection measures required by permits and policy. The following sections summarize the key conclusions regarding impacts.

ES.9.1 Air Quality

In general, the highest air quality impacts would be associated with those alternatives that have more potential for oil and gas development activity. The concentrations of directly emitted pollutants such as carbon monoxide, sulfer dioxide, and greenhouse gases are expected to increase as a result of increased oil and gas development. Emission estimates for each alternative were not developed for this analysis but it is expected that the potential development will be bound by the different levels of emissions considered in the Colorado Air Resources Modeling Management Study (CARMMS) used in this analysis. CARMMS developed high, medium and low emissions scenarios that account for different levels of oil and gas development as well as emission controls. In general the CARMMS modeling determined that no scenario contributes significantly to adverse effects on air quality and air quality related values (visibility and atmospheric pollutant deposition). Because the level of development under

all the alternatives falls within the CARMMS scenarios that were modeled, it is reasonably expected that the impacts from all alternatives would not significantly impact air quality. Disclosure of emissions inventories at the project level and monitoring would be required during development and production. The range of annual contribution to global greenhouse gas emissions is estimated to be between 908,770 metric tons of carbon dioxide equivalent and 1,160,586 metric tons of carbon dioxide equivalent-+ depending on the potential level of development. This annual estimate was developed for the maximum oil and gas production year in 2021.

ES.9.2 Geology and Minerals

Alternatives 1 and 2 would provide less coverage of lands subject to geologic hazards under NSO stipulations and the resource-specific CSU stipulation as compared to Alternatives 3 and 4. Alternative 5 provides the most protections through cancellation of all leases. Under Alternatives 1 and 2, an estimated total of 593 Bcf of gas would be produced. Alternatives 3 and 4 would reduce production to 590 and 550 Bcf of gas, respectively. Alternative 5 would result in a resource loss of an estimated 45 Bcf of gas. The reliance on the Potential Fossil Yield Classification system management objectives and stipulations of other resources in Alternatives 1 and 2 would not provide as great a degree of protection as the CSU stipulation for Alternatives 3 and 4. There would be no stipulations for the protection of fossil resources for Alternative 5 beyond the Potential Fossil Yield Classification system.

ES.9.3 Soils

While the acreage of surface disturbance associated with projected oil and gas development would be similar under Alternatives 1 through 4, the extent of protection of erodible soils from lease stipulations would be greatest under Alternative 4. Under Alternative 4, there would be fewer wells, well pads, and roads constructed and less off-lease development in Zone 3 due to the designated areas closed to leasing. The least amount of potential risks to erodible soils would result from Alternative 5 because all leases would be canceled, most of the surface disturbance would occur on previously disturbed soils, and reclamation and revegetation would be implemented for the entire analysis area.

ES.9.4 Water Resources

Compared to the No Action Alternative, Alternatives 2 through 5 i progressively provide increased protection to surface water resources inside the lease boundaries through stipulations that limit surface disturbance and minimize sedimentation. However, the increased coverage to the lease areas may have the opposite impact to the areas outside the leases by causing the disturbance to occur off-lease. Therefore, Alternatives 2 through 4 may increase the risk of impacts to water resources in the areas immediately adjoining the leases. Alternative 5 would provide the most coverage to water resources, including those outside the lease areas.

There are no groundwater coverage stipulations in Alternatives 1 and 2. It may be possible that stipulations for other resources may offer some coverage for groundwater, but stipulations for other resources may not be adequate. Protection of groundwater resources would rely on operators' compliance with federal and state requirements. Alternatives 3 and 4 have a groundwater stipulation that covers limited areas of potential concern. Stipulations for other resources would not be adequate to protect groundwater because they do not contain the technological and engineering controls necessary to lower the risk of contamination. Alternative 4 provides more potential coverage for groundwater when taking into account the leases that would be canceled and closed to future leasing. As with surface water, Alternative 5 would minimize potential impacts to groundwater resources to the greatest extent when compared to the other alternatives.

ES.9.5 Vegetation Resources

Under Alternative 1 (the No Action Alternative) and Alternative 2 level of NSO coverage afforded to vegetation resources by NSO stipulations would be minimal as development could occur in any vegetation type, including riparian habitat and other suitable habitat for special status species. Under Alternative 3, more riparian and most special status species suitable habitat would be precluded from surface disturbance and covered by CSU stipulations requiring surveys or special development techniques to minimize disturbance. While both Alternatives 3 and 4 preclude surface disturbance within special status species habitat to a similar degree, Alternative 4 would offer an advantage over Alternative 3 because in Zone 3, much of the surface disturbance in special status species habits would be precluded through lease cancellation, which cannot be exempted. Alternative 5 would minimize the potential for the impacts to vegetation resources to the greatest extent, since all surface disturbance would be associated with reclamation. The potential for the introduction of noxious weeds would be similar under Alternative 1, 2, 3, and 4 but lower under Alternative 5. Under all alternatives, the BLM would retain the ability to relocate operations to some degree and require Best Management Practices or other measures to minimize the potential for noxious weeds to become established or proliferate.

ES.9.6 Terrestrial Wildlife Resources

Under Alternative 1, wildlife-specific NSO stipulations would be applied to bighorn sheep ranges and elk and mule deer game winter ranges. With consideration of all NSO stipulations, Zone 1 would be fully covered by NSO, thus potentially protecting all terrestrial wildlife resources, including all bighorn sheep habitat. Within the remaining zones, NSOs would cover a small amount of elk winter range, but no designated mule deer winter ranges, and less than half of bighorn sheep both overall and summer ranges. The Big Game Winter Range TL stipulation that would apply to mule deer a nd elk winter range within the analysis area would not always cover winter range as it is currently mapped. All known locations of federally listed species would be precluded from surface disturbance. Alternative 2 stipulations would result in a slight increase in coverage to increase elk winter range, elk production areas, and lynx denning habitat as compared to Alternative 1. Under Alternative 3, Zone 1 also would be fully precluded from surface disturbance. The NSO for big game would cover a greater percentage of big game sensitive habitats (between 60 and 100 percent), and big game timing stipulations would cover between 71 and 100 percent of big game winter ranges. Moose sensitive habitat would have between 80 and 100 percent coverage. All known locations of federally listed species as well as their designated habitat would be covered under NSO stipulations. Alternative 5 would result in the least impact to recreation as disturbance activities would impact a much smaller acreage and would be related to reclamation.

ES.9.7 Aquatic Resources

In summary, the highest level of potential impacts to aquatic habitat and species would occur under Alternatives 1 and 2, as indicated by the percentage of perennial streams not subject to resource stipulations. Potential impacts would include habitat loss or alteration and negative changes in water quality. In contrast, there would be no impacts to game fish and special status aquatic species under Alternatives 3 and 4, since streams that contain these species are subject to aquatic-focused stipulations. There could be impacts to a limited number of perennial streams that do not contain game fish or special status species under Alternatives 3 and 4. Potential water use from drilling and completion would negatively affect aquatic species if there are new depletions. The estimated volume of potential water use is similar for Alternatives 1 through 4, although Alternative 4 would be slightly higher than the other alternatives. Under Alternative 5, there would be no potential alteration of aquatic habitat after reclamation and there would be no water use or depletions related to well drilling or completion within the lease zones.

ES.9.8 Cultural Resources

The potential risks to cultural resources derive from the extent of surface disturbance and the relative protection through the limitation of surface disturbance under each alternative. For those alternatives where oil and gas development is projected (Alternatives 1 through 4), Alternative 4 would have the greatest extent of protection from surface disturbance and the fewest sites at risk from construction and development activities, while Alternative 1 would have the least protection and greatest risk. Alternative 5 would have the lowest potential adverse effects on cultural resources due to the low area of projected surface disturbance and the reclamation of existing disturbed areas. However, it is unlikely that sites that are eligible for the national Register of Historic Places would be adversely affected under any alternative because federal regulations require site-specific surveys before surface-disturbing activities begin and avoidance or mitigation of eligible sites.

ES.9.9 Transportation

Within the analysis area the maximum estimated new road construction would take place within Zone 2 under Alternatives 1 and 2. Additionally, the highest average daily vehicle round-trips and total trips would take place within Zone 2 under Alternatives 1 and 2, resulting in impacts such as decreased travel speeds, travel delays, and increased vehicle collision rates. Impacts to local areas and roads of concern near the Thompson Divide area, Glenwood Springs, and Carbondale also would be greatest under Alternatives 1 and 2, although impacts would be spread along a 20-year development period. Alternatives 3 and 4 would produce slightly less impacts to transportation resources as a result of the potential development of fewer wells pads and associated wells. Alternative 5 would produce fewer impacts than Alternative 1 and the least of any alternative as existing wells are plugged and abandoned and lease pads and access roads reclaimed.

ES.9.10 Land Use

As compared to when compared to Alternative 1, Alternatives 3 and 4 contain the most stipulations, which would limit where and when federal lands and realty authorizations may be modified or issued and how land uses would change.

ES.9.11 Special Designations

Within the analysis area, the maximum net long-term disturbance in acres across all alternatives, would be less than 0.8 percent of the analysis area. Under all alternatives, surface disturbance would be precluded in the Lower Battlement Research Natural Area and all Colorado Roadless Areas (CRAs) in Zone 1 through one or more NSO stipulation. Under Alternative 1, NSO stipulations would cover 64 percent of Zone 2 CRAs and about 7 percent of Zone 3 CRAs; under Alternatives 3 and 4, this coverage would be increased to about 88 percent, with additional constraints provided by CSU stipulations. Alternative 5 would produce fewer impacts than Alternative 1 and the least of any alternative as existing wells are plugged and abandoned 31 and lease pads and access roads reclaimed within CRAs.

ES.9.12 Recreation

Under each alternative, impacts from noise, lights, dust, smell, and activities associated with lease development could cause recreationists to relocate to a more natural setting. The greatest potential for impacts lies within Semi-Primitive Non-Motorized and Semi-Primitive Non-Motorized Recreation Opportunity Spectrum (ROS) Classes, recreation-oriented management areas, or other areas where the characteristics of remoteness and naturalness would be vulnerable. Under Alternative 1 and 2, the RFDS for Zones 2, 3, and 4 could be developed in any ROS class and in backcountry year-round motorized and dispersed recreation management areas (in Zone 1, all surface disturbances would be fully precluded). Under Alternative 3, surface disturbance would be fully precluded in Zone 1, NSO protections would generally be between 80 and 95 percent in all ROS classes in Zones 2, 3, and 4, and a greater portion of management areas with a recreational emphasis would be precluded from surface

disturbance. Alternative 4 would be the same as Alternative 3, except in Zone 3, where the combination of lease cancellations and NSO stipulations would decrease the acreage in which development would take place. Alternative 5 would result in the least impact to recreation as all disturbance activities would be related to reclamation.

ES.9.13 Livestock Grazing

Oil and gas development under Alternatives 1 and 2 would have the greatest potential for impacts to livestock grazing operations within the analysis area due to the least amount of coverage from associated stipulations (25 and 30 percent and the lease areas, respectively). This does not necessarily equate to less surface disturbance under Alternative 2 compared to Alternative 1; however, it would influence where development would take place, some disturbance may occur off-lease or the same amount of disturbance may be concentrated into a smaller area. Under Alternatives 3 and 4, 100 percent of the allotments areas overlapped by leases would receive coverage from stipulations. Under Alternative 5 stipulations would not affect the associated allotments because no future development would occur and existing wells, pads and roads would be plugged, abandoned, and reclaimed with the intention of returning 86 acres to pre-disturbance condition.

ES.9.14 Scenic Resources

Alternative 1, the No Action Alternative, offers the least coverage of high scenic value resources and there is potential for the RFDS occur in areas with High, Moderate, and Low Scenic Integrity Objectives (SIOs). Development in Moderate SIOs may be inconsistent with the Forest Plan, and on some leases in Zone 2, it may not be possible to locate all new development within areas of lower scenic importance and sensitivity. Alternative 2 would have similar impacts except there would be slightly more NSO and resource-specific CSU coverage in areas of high scenic value. Under Alternative 3, the potential for RFDS development in High and Moderate SIOs would be largely eliminated through NSO stipulations. A resource-specific CSU would be applied most areas where development is still possible in Moderate SIO. Alternative 4 would have the same potential impacts as Alternative 3 except in Zone 3, where over 60 percent of the lease area would be cancelled. Alternative 5 offers the greatest opportunity to maintain or improve high scenic value resources over the long term through cancellation of all leases.

ES.9.15 Hazardous Materials and Human Health and Safety

Activities conducted under any of the alternatives carry risks of spills and releases of hazardous materials and solid waste. In the absence of stipulations, activities would be carried out in accordance with applicable regulatory programs. The No Action Alternative would statistically present the greatest risk for spills, followed by Alternatives 2, 3, 4, and 5. The risks are much less under Alternative 5 compared with the other four alternatives since the major hazardous material that would be used would be petroleum fuels and other chemicals and materials used in gas production would not be present. Compared to the No Action Alternative, Alternatives 2 through 5 would progressively minimize the potential for impacts to human health and safety through lower levels of development, stipulations that would limit development near public water supply source areas, and reduced vehicle and equipment use. Alternative 4 would minimize the risk to human health and safety relative to Alternatives 1, 2, and 3 due to lease cancellation. In comparison to the No Action Alternative and Alternative 2, Alternatives 3, 4, and 5 would reduce oil and gas development revenues that would benefit emergency services. Alternative 5 would minimize the risk to human health and safety to the greatest degree by cancelling all leases but would eliminate all lease-related revenue that might fund emergency services.

ES.9.16 Socioeconomics

Under Alternatives 1 and 2, total future natural gas production is projected to be approximately 312 billion cubic feet (Bcf) over the 20-year period (2017 to 2036) and the future revenue value of the total new natural gas production would be almost $1.6 billion. Total direct jobs from construction and operation are expected to be 93 full time equivalents (FTEs) in 2017 and increase to 182 FTEs by 2036; representing a total increase in employment of 2,751 job-years over the 20-year period. In addition, county and local government revenues from future lease development to projected to add new government jobs; these jobs as well as projected indirect and induced jobs are an additional 2,429 job years. Alternatives 1, 2, and 3 are expected to generate future county revenue payments of approximately $113 million in total over the 20-year period. Future natural gas production is expected to be less than 1 percent lower under Alternatives 3 and 7 percent lower under Alternative 4. Alternative 4 would generate slightly fewer annual jobs. Alternative 4 would result in future total county revenue receipts of approximately $107 million. Under Alternative 5, the closure of the 75 existing wells is expected to result in a loss of approximately 45 Bcf of natural gas production worth approximately $188 million, a total employment loss of approximately 333 FTEs and a total future county revenue loss of approximately $13 million. In addition, Alternative 5 would result in the non-development of leases as foreseen in Alternative 1, and therefore there would have the total loss of approximately 357 Bcf of natural gas production worth approximately $1.8 billion, an employment loss of approximately 5,513 FTEs and a total future county revenue loss of approximately $126 million.

ES.9.17 Environmental Justice

No disproportionate and adverse effects to environmental justice communities are expected from any of the action alternatives as no environmental justice communities were identified within the study area.

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List of Acronyms

°F	degrees Fahrenheit
µeq/l	micro-equivalent per liter
µg/m^3	micrograms per cubic meter
AASHTO	American Association of State Highway and Transportation
ACHP	Advisory Council on Historic Preservation
AEO	Annual Energy Outlook
ALC	Aquatic Life Cold
amsl	above mean sea level
ANC	acid neutralizing capacity
APCD	Air Pollution Control Division
APD	Application for Permit to Drill
APE	Area of Potential Effect
AQRV	air quality related value
AUM	animal unit month
BA	Biological Assessment
BBC	BBC Research and Consulting
Bcf	billion cubic feet
BE	Biological Evaluation
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BLS	Bureau of Labor Statistics
BMP	Best Management Practice
C&H	Cattle and Horse Allotment
CAA	Clean Air Act
CARMMS	Colorado Air Resources Management Modeling Study
CARMS	Colorado Air Resources Management Modeling Study
CARPP	Comprehensive Air Resource Protection Protocol
CBNG	coalbed natural gas
CCR	Colorado Code of Regulations
CDOT	Colorado Department of Transportation
CDOW	Colorado Division of Wildlife
CDPHE	Colorado Department of Public Health and Environment
CDWR	Colorado Division of Water Resources
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CGS	Colorado Geological Survey

CH_4	methane
CIAA	Cumulative Impacts Analysis Area
CNHP	Colorado Natural Heritage Program
CO	carbon monoxide
CO_2	carbon dioxide
CO_2(e)	carbon dioxide equivalent
COA	Condition of Approval
COGCC	Colorado Oil and Gas Conservation Commission
CPW	Colorado Parks and Wildlife
CR	County Road
CRA	Colorado Roadless Area
CRCT	Colorado River Cutthroat Trout
CRR	Colorado Roadless Rule
CRVFO	Colorado River Valley Field Office
CSU	Controlled Surface Use
CSWAP	Colorado Source Water Assessment and Protection
CTL	Closed to Leasing
CWA	Clean Water Act
DAU	Data Analysis Unit
dBA	decibels on the A-weighted scale
DOLA	Department of Land Affairs
DVF	Future Design Value
E&P	exploration and production
EIS	Environmental Impact Statement
EO	Executive Order
EPCRA	Emergency Planning and Community Right-to-Know Act
EPS-HDT	Economic Profile System-Human Dimension Toolkit
ESA	Endangered Species Act
FLAG	Federal Land Managers' Air Quality Related Values Work Group
FLM	Federal Land Manager
FLPMA	Federal Land Policy and Management Act of 1976
FML	Federal Mineral Lease
FO	Field Office
Forest Service	U.S. Forest Service
FR	Federal Register
FSM	Forest Service Manual
FSVeg	Forest Service Field Sampled Region 2 Vegetation Data
FTE	full time equivalent
GBCT	greenback lineage cutthroat trout
GHG	greenhouse gas

GHMA	General Habitat Management Areas
GIS	Geographic Information System
GJFO	Grand Junction Field Office
GMU	Game Management Unit
GMUGNF	Grand Mesa, Uncompahgre, and Gunnison National Forest
gpm	gallons per minute
H_2S	hydrogen sulfide
HAP	Hazardous Air Pollutant
HM	Head month
HUC	Hydrologic Unit Code
I-70	Interstate 70
IBLA	Interior Board of Land Appeals
IM	Instruction Memorandum
IMPROVE	Interagency Monitoring of Protected Visual Environments
IPCC	Intergovernmental Panel on Climate Change
IRA	inventoried roadless area
LAC	Level of Acceptable Change
LRMP	Land Resource Management Plan
MATS	Modeled Attainment Test Software
MBTA	Migratory Bird Treaty Act
Mcf	billion thousand cubic feet
mg/L	milligrams per liter
MIS	Management Indicator Species
MLA	Mineral Leasing Act of 1920
MLRA	Major Land Resource Area
$MMTCO_2e$	million metric tons of carbon dioxide equivalents
MP	milepost
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NFMA	National Forest Management Act
NFS	National Forest System
NHPA	National Historic Preservation Act of 1966, as amended
NO_2	nitrogen dioxide
NOI	Notice of Intent
NORM	naturally occurring radioactive materials
NO_X	oxides of nitrogen
NPS	National Park Service
NRCS	Natural Resources Conservation Service

NRHP	National Register of Historic Places
NSO	No Surface Occupancy
NSPS	New Source Performance Standards
O_3	ozone
OSHA	Occupational Safety and Health Administration
P.L.	Public Law
PBA	Programmatic Biological Assessment
PBO	Programmatic Biological Opinion
PFYC	Potential Fossil Yield Classification
PHMA	Priority Habitat Management Area
PHMSA	Pipeline & Hazardous Materials Safety Administration
PILT	Payments in Lieu of Taxes
PM	particulate matter
PM_{10}	particulate matter with an aerodynamic diameter of 10 microns or less
$PM_{2.5}$	particulate matter with an aerodynamic diameter of 10 microns or less
ppb	parts per billion
ppm	parts per million
PSD	prevention of significant deterioration
PUD	Planned Unit Development
RCRA	Resource Conservation and Recovery Act
REL	Reference Exposure Level
RfC	Reference Concentrations for Chronic Inhalation
RFD	Reasonably Foreseeable Development
RFDS	Reasonably Foreseeable Development Scenario
RFFA	reasonably foreseeable future actions
RMP	Resource Management Plan
RNA	Research Natural Areas
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
ROW	right-of-way
RPPA	Roan Plateau Planning Area
SARA	Superfund Amendments and Reauthorization Act
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SHPO	State Historic Preservation Office(r)
SIA	Special Interest Area
SIO	Scenic Integrity Objective
SLT	Standard Lease Term
SO_2	sulfur dioxide
SPCC Plan	Spill Prevention, Control, and Countermeasure Plan
SPM	Semi-primitive Motorized

SPNM	Semi-primitive Non-motorized
SR	State Route
SUPO	Surface Use Plan of Operation
SWAP	Source Water Assessment and Protection
SWPP	Source Water Protection Plan
TCP	Traditional Cultural Property
TDS	total dissolved solid
TENORM	Technologically Enhanced naturally occurring radioactive materials
TEPC	Threatened, Endangered, Proposed, and Candidate
TIPU	Transportation, Information, Power, and Utilities
TL	Timing Limitation
TPQ	threshold planning quantities
tpy	tons per year
U.S.	United States
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture
USDOT	U.S. Department of Transportation
USEIA	U.S. Energy Information Administration
USEPA	U.S. Environmental Protection Agency
USFS	United States Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	volatile organic compound
WA	Wilderness Area
WEM	Waivers, Exceptions, or Modification
WIZ	Water Influence Zones
WRFO	White River Field Office
WRNF	White River National Forest
WUS	Waters of the U.S.

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1.0 Background; Purpose of and Need for Action

1.1 Introduction

In compliance with the National Environmental Policy Act of 1969, as amended (NEPA), the Bureau of Land Management (BLM) Colorado River Valley Field Office (CRVFO) in Silt, Colorado, has prepared this Environmental Impact Statement (EIS) to analyze the issuance of 65 federal fluid minerals leases within the White River National Forest (WRNF). These leases were issued between 1995 and 2012, and are located in Mesa, Garfield, Pitkin, and Rio Blanco counties, between the towns of De Beque and Carbondale south of Interstate 70, except for one lease northeast of Meeker (see **Figure 1-1**).

1.1.1 Background

The decision that made the 65 parcels considered in this EIS available for oil and gas leasing was documented through the 1993 WRNF Oil and Gas Leasing Record of Decision (ROD) and reaffirmed in the 2002 WRNF Land Resource Management Plan (LRMP). Before offering the nominated parcels in an oil and gas lease sale, the BLM obtained consent from the United States (U.S.) Forest Service (Forest Service or USFS) and subsequently issued the leases.

In 2007, the Interior Board of Land Appeals (IBLA) held that before including Forest Service parcels in an oil and gas lease sale the BLM must either formally adopt NEPA analysis completed by the Forest Service or conduct a NEPA analysis of its own (see Board of Commissioners of Pitkin County, 173 IBLA 173 [2007]). The IBLA ruled that although the BLM was a cooperating agency on the Forest Service's 1993 WRNF Oil and Gas Leasing EIS, the BLM did not formally adopt the Forest Service NEPA analysis or prepare its own analysis, and therefore did not comply with its NEPA obligations with respect to the issuance of those leases at issue in that proceeding. While the 2007 IBLA decision only specifically addressed 4 of the previously issued leases, all the remaining 65 leases are in the same procedural posture with respect to issuance.

Following the IBLA's decision, the BLM determined that the Forest Service NEPA analysis conducted for the previously issued leases is no longer adequate due to changes in laws, regulations, policies, and conditions since the Forest Service's EIS was issued in 1993.

Examples of changed circumstances since 1993 to be considered in the current EIS include modifications to the federal endangered and threatened species list and guidance, major changes to the National Ambient Air Quality Standards, implementation of the Colorado Roadless Rule, and new oil and gas drilling and production technologies.

In total, the BLM identified 65 existing leases with effective dates ranging from 1995 to 2012 that were issued based on the 1993 WRNF EIS. Based on the foregoing, the BLM determined that it is necessary to conduct additional NEPA analysis to evaluate the impacts of its leasing decisions within the WRNF. The decision of whether forest system lands are available or unavailable for oil and gas leasing, however, remains with the Forest Service, although the BLM retains the ultimate discretion whether to issue a lease (43 Code of 36 Federal Regulations [CFR] 3101.7-2). As result, this EIS only considers the 65 currently leased parcels and not future leasing availability, which has recently been addressed in a separate NEPA analysis, the WRNF Oil and Gas Leasing Final EIS published by the Forest Service in December 2014 (U.S. Forest Service [USFS] 2014a). The BLM has incorporated as much of the Forest Service's new NEPA analysis of future oil and gas leasing on the WRNF as possible into this analysis. The BLM is a cooperating agency on the WNRF EIS.

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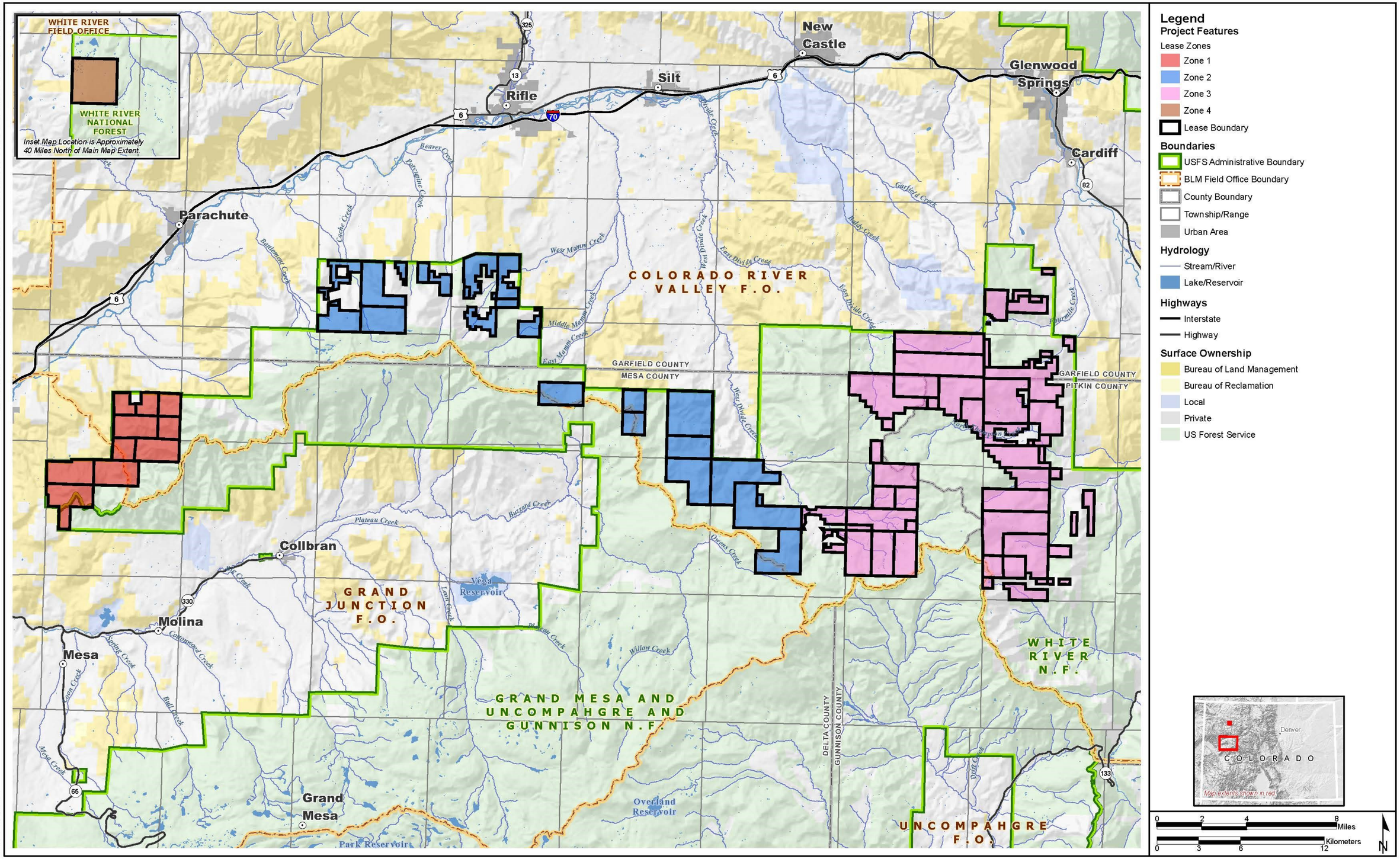

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Date: 9/17/2015

Figure 1-1 General Location of Leases to be Evaluated

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1.1.2 Leases

The 65 previously issued leases under consideration in this EIS are listed in **Table 1-1** with the current status of each lease. The total area of existing leases is 80,380 acres. Of the 65 leases to be evaluated in this EIS, 34 are either expired or under suspension, 20 are committed to established oil and gas units, and 5 are held by production. The remainder of the 65 leases have a future expiration date. It should be noted that some leases listed in the table have expired since the beginning of the NEPA process and other leases are under appeal and could be eliminated before the completion of the NEPA process. All 65 leases included at the beginning of the NEPA process have been carried forward for consistency of analysis.

Table 1-1 Status of Existing Leases Under Evaluation

Lease #	Effective Date	Expiration Date	Status[1]
COC 058677	12/1/1995		Committed to Orchard Unit
COC 059630	10/1/1996		Committed to Orchard Unit
COC 066727	09/1/2003	08/31/2013	Committed to Orchard Unit
COC 066728	09/1/2003		Committed to Orchard Unit
COC 066729	09/1/2003		Committed to Orchard Unit
COC 066730	09/1/2003		Committed to Orchard Unit
COC 066731	09/1/2003		Committed to Orchard Unit
COC 066732	06/1/2003		Committed to Place Mesa Unit
COC 066733	06/1/2003		Committed to Place Mesa Unit
COC 066926	09/1/2003	08/31/2013	Committed to Place Mesa Unit
COC 061121	10/1/1998		Committed to Middleton Creek Unit & Held by Production
COC 066723	06/1/2003	05/31/2014	Under Suspension
COC 066724	06/1/2003		Held by Production
COC 066915	09/1/2003	11/11/2016	Lease automatically extended upon unit termination
COC 066916	09/1/2003	11/11/2016	Lease automatically extended upon unit termination
COC 066917	09/1/2003	11/11/2016	Lease automatically extended upon unit termination
COC 066918	09/1/2003		Held by Production
COC 066920	09/1/2003	8/31/2013	Held by Production
COC 067147	04/1/2004		Committed to Middleton Creek Unit
COC 067150	12/1/2003		Held by Allocation (Communitization Agreement COC 073718)
COC 067542	09/1/2004	08/31/2014	Under Suspension
COC 067543	09/1/2004	08/31/2014	Expired
COC 067544	09/1/2004		Held by Production
COC 070013	07/1/2007		Committed to Middleton Creek Unit
COC 070014	06/1/2007	05/31/2017	Under suspension
COC 070015	06/1/2007	05/31/2017	Under suspension
COC 070016	06/1/2007	05/31/2017	
COC 070361	01/1/2008		Committed to Middleton Creek Unit

Table 1-1 Status of Existing Leases Under Evaluation

Lease #	Effective Date	Expiration Date	Status[1]
COC 072157	01/1/2008	12/31/2017	
COC 075070	01/1/2012	12/31/2021	Under suspension
COC 076123	01/1/2012	12/31/2021	
COC 058835	09/1/1996	11/11/2011	Expired, but subject to appeal
COC 058836	09/1/1996		Under Suspension; committed to Willow Creek Unit
COC 058837	09/1/1996		Under Suspension; committed to Willow Creek Unit
COC 058838	09/1/1996		Under Suspension; committed to Willow Creek Unit
COC 058839	09/1/1996		Under Suspension; well capable of production
COC 058840	09/1/1996	11/11/2011	Expired, but subject to appeal
COC 058841	12/1/1996	11/11/2011	Expired, but subject to appeal
COC 066687	06/1/2003	05/31/2013	Under Suspension
COC 066688	06/1/2003	05/31/2013	Under Suspension
COC 066689	06/1/2003	05/31/2013	Under Suspension
COC 066690	06/1/2003	05/31/2013	Under Suspension
COC 066691	06/1/2003	05/31/2013	Under Suspension
COC 066692	06/1/2003	05/31/2013	Under Suspension
COC 066693	06/1/2003	05/31/2013	Under Suspension
COC 066694	06/1/2003	05/31/2013	Under Suspension
COC 066695	06/1/2003	05/31/2013	Under Suspension
COC 066696	06/1/2003	05/31/2013	Under Suspension
COC 066697	06/1/2003	05/31/2013	Under Suspension
COC 066698	06/1/2003	05/31/2013	Under Suspension
COC 066699	06/1/2003	05/31/2013	Under Suspension
COC 066700	08/1/2003	07/31/2013	Under Suspension
COC 066701	06/1/2003	05/31/2013	Under Suspension
COC 066702	08/1/2003	07/31/2013	Under Suspension
COC 066706	06/1/2003	05/31/2013	Under Suspension
COC 066707	06/1/2003	05/31/2013	Under Suspension
COC 066708	09/1/2003	08/31/2013	Under Suspension
COC 066709	09/1/2003	08/31/2013	Under Suspension
COC 066710	06/1/2003	05/31/2013	Under Suspension
COC 066711	06/1/2003	05/31/2013	Under Suspension
COC 066712	06/1/2003	05/31/2013	Under Suspension
COC 066908	09/1/2003	08/31/2013	Under Suspension
COC 066909	10/1/2003	09/30/2013	Under Suspension

Table 1-1 Status of Existing Leases Under Evaluation

Lease #	Effective Date	Expiration Date	Status[1]
COC 066913	12/1/2003	11/30/2013	Expired, but subject to appeal
COC 066948	9/1/2003		Under Suspension

[1] Section 39 of the Mineral Leasing Act of 1920 (MLA), as amended, provides for a suspension of operation and production in the interest of conservation of natural resources, which addresses a variety of reasons, including protection of natural resources, initiation of environmental studies that may modify the lease(s); or litigation related to issuance of leases or BLM lease management related issues. The term of a lease suspended under Section 39 shall be extended by adding the suspension period. Per Section 17f of the MLA, "no lease shall be deemed to expire during a suspension of either operations or production." An operator may request a suspension for a variety of reasons, including extraordinary weather conditions that prevent required surveys or drilling activities, active litigation over title to lease or surface access, or a denial of an operational proposal by the BLM.

1.2 Federal Fluid Mineral Leasing Process on Forest Service Lands

When NFS lands are proposed for fluid mineral leasing, the Forest Service must verify that the lands have been adequately analyzed in a Forest Plan level leasing analysis, that leasing decisions are based on the analysis, and that there is no new significant information or circumstances requiring further environmental analysis. The Forest Service leasing analysis must comply with the National Forest Management Act and associated regulations at 36 CFR 219 and 36 CFR 228.102, by considering the suitability of lands for leasing and development and making decisions regarding the availability for leasing. Once the analysis is determined to be adequate, the Forest Service can consent to allowing the BLM to issue a lease on those lands. The leases must incorporate the stipulations that were determined to be required in the Forest Service leasing analysis and Forest Plan, as required by 43 CFR 3101.7-2(a), which states the following:

> *Where the surface managing agency has consented to leasing with required stipulations, and the Secretary decides to issue a lease, the authorized officer shall incorporate the stipulations into any lease which it may issue. The authorized officer may add additional stipulations.*

Following is a brief summary of the leasing and development process for federal fluid minerals on NFS lands. A more complete description of the leasing process can be found in Section 1.4.2 and Appendix C of the WRNF Oil and Gas Leasing Final EIS (USFS 2014a).

The BLM must either adopt the Forest Service leasing analysis or conduct a separate leasing analysis in compliance with NEPA and its implementing regulations at 40 CFR 1500 – 1508 and Department of the Interior NEPA regulations at 43 CFR Part 46, in considering the effects of leasing on the human environment, including reasonably foreseeable future development. Section 1.5.2 of the WRNF Oil and Gas Leasing Final EIS (USFS 2014a) provides additional information on the BLM's process and authority for offering leases for sale and issuing leases on the WRNF.

Federal onshore oil and gas leasing requirements are set out in the regulations at 43 CFR 3100. Oil and gas leases are issued with a primary term of 10 years, expiring at the end of the tenth year unless:

- Drilling operations are in progress on or for the benefit of the lease;
- The lease contains a well capable of producing oil or gas in economic quantities;
- The lease is receiving or is entitled to receive an allocation of production under the terms of an approved communitization agreement or unit agreement; or
- The lease is suspended by the BLM.

The lessee may surrender the lease in whole or in part by filing a written request with the BLM State Office. In that case, the lessee is responsible for plugging any existing producing or abandoned wells, and reclaiming any surface disturbance according to the requirements of the permitting agency. Leases without a producible well automatically terminate if the lessee fails to make annual rental payments. A nonproducing lease may be administratively canceled for failure to comply with lease terms. Under certain circumstances, a lessee may request reinstatement of a terminated lease (43 CFR Subpart 3108).

Per 43 CFR 3162.3-1, to develop a lease the operator must submit an Application for Permit to Drill (APD) to the BLM accompanied by a Surface Use Plan of Operations (SUPO) to be approved by the Forest Service. The submittal of the APD and the SUPO trigger a second level of NEPA analysis, onsite reviews, and decision-making that is more site-specific than the analysis prepared prior to lease issuance. At this time, the Forest Service can decide on the conditions for approval of the surface operations and the BLM can decide on the conditions for approval of the subsurface operations. After consulting with the Forest Service, the BLM must approve the application (with or without additional conditions), disapprove the application, or advise the applicant why the decision has been delayed.

1.2.1 Reasonably Foreseeable Development Scenario

The Reasonably Foreseeable Development Scenario (RFDS) provides a long-term projection of the likely potential future oil and gas development and production within a defined area (the WRNF) and a defined period of time (20 years). The WRNF RFDS was prepared by the BLM for the Forest Service in 2010, and was included as Appendix F in the WRNF Oil and Gas Leasing Draft EIS (USFS 2012).

As stated in the RFDS (USFS 2010a), its purpose is to provide an estimated projection of unconstrained, future oil and gas exploration and development based on a set of assumptions in order "to evaluate potential effects that might reasonably occur as a result of leasing." The RFDS is based on geology; resource occurrence potential; past and current leasing, exploration, and development activity; and engineering technology, with consideration of economics and physical limitations on access to resources. An RFDS is not a decision, and it does not establish or imply a limit on future development.

The RFDS (USFS 2010a) was used as a starting point for estimating the number of wells likely to be developed within the 65 leases that are under evaluation. Using this as the basis for estimating well numbers allows the BLM to build on the previously prepared analysis completed for the Forest Service while focusing on the 65 leases using reasonable assumptions and patterns of observed development. Its use facilitates an analysis that is consistent with the Forest Service's assumptions and analyses presented in the WRNF Oil and Gas Leasing Final EIS (USFS 2014a), reducing the potential for inconsistencies between the projections for the 65 leases in this EIS and future leasing in the WRNF EIS and enabling better coordination between the Forest Service and the BLM.

The basic assumptions used to develop the estimated unconstrained oil and gas development within the 65 leases are summarized below.

- At least one well can be reasonably foreseen for each of the 65 leases.
- Future development will follow past development trends.
- Almost 4 percent of all wells will be horizontally drilled.
- A total of 444 wells is projected within the 65 leases without taking into account constraints such as No Surface Occupancy (NSO) stipulations.
- The 444 wells would not be evenly distributed across the 65 leases. Rather, the leases have been grouped spatially into zones based on the location of past development, production infrastructure, and access for exploration and production.

The following zones were used to estimate the projected well numbers and types. The leases within each zone are displayed on **Figure 1-1**. It is important to understand that the zones do not constitute management units or legal entities. They are intended only to be used to facilitate the analysis of indirect effects across the EIS alternatives by grouping the leases geographically and to organize the leases by terrain and development potential where useful to the resource discussions. New oil and gas development could be accessed from existing or new well pads constructed on each lease or on adjacent private or BLM land using directional or horizontal drilling technologies.

1.2.1.1 Zone 1

Zone 1 includes 10 leases at the western edge of the analysis area. There are 131 existing wells within 2 miles of the lease boundaries within this zone and, based on the RFDS, it is projected that there would be 63 new wells developed over the next 20 years, should the leases be made available without constraints. It is estimated that 95 percent of all horizontal wells in the analysis area would occur in this zone. The primary target formations are the Mesa Verde and the Niobrara. Existing infrastructure includes pipelines and roads that were constructed to serve the existing wells in the Orchard and Place Mesa units.

1.2.1.2 Zone 2

Zone 2 includes 21 leases within an area in approximately the center of the east-west alignment of the 65 leases. There are 733 existing wells within 2 miles of the lease boundaries within this zone and, based on the RFDS, it is projected that there would be 318 new wells developed over the next 20 years, should the leases be made available without constraints. New development could be accessed primarily from existing and newly constructed well pads. Most of the successful development has been from the Mesa Verde Formation, but due to a successful horizontal Niobrara well, it is anticipated that future development would be likely to produce from both formations using mainly directional or vertical technologies. It is estimated that 5 percent of all horizontal wells in the analysis area would occur in this zone. Existing infrastructure includes the numerous pipelines and roads that access the existing wells.

1.2.1.3 Zone 3

Zone 3 includes 33 leases within an area in the eastern part of the 65 leases. There are 50 existing wells within 2 miles of the lease boundaries within this zone and, based on the RFDS, it is projected that there would be 53 new wells developed over the next 20 years, should the leases be made available without constraints. New development would be accessed primarily from newly constructed well pads, with little exploration anticipated. No horizontal wells are expected to be drilled in this zone. Existing infrastructure includes Forest Service roads and pipelines. To successfully develop wells in this zone, road improvements and pipeline installation would be necessary.

1.2.1.4 Zone 4

Zone 4 includes only one lease (COC 066948), located approximately 40 miles north of the main analysis area near Meeker, Colorado. There are no existing wells within this zone or within 2 miles of the lease so the projected 10 new wells could only be accessed from newly constructed well pads. No horizontal wells are projected and existing infrastructure is limited to a county road and a pipeline within one mile of the lease boundary.

1.2.1.5 Summary of Existing and Potential Future Wells by Zone

Table 1-2 summarizes the existing wells and projected future unconstrained development in each zone, assuming no constraints such as lease stipulations.

Table 1-2 Existing Wells and Future Development by Zone

Current or Future	Well type	Zone 1	Zone 2	Zone 3	Zone 4	Total
Existing wells within 2 miles of lease boundaries	Horizontal	19	1	0	NA	**20**
	Directional	68	649	3	NA	**720**
	Vertical	44	83	47	NA	**174**
	Total	**131**	**733**	**50**	**NA**	**914**
Existing well distribution	Percentage of total wells	14.3%	80.2%	5.5%	NA	**100%**
	Percentage of horizontal wells	95.0%	5.0%	0.0%	NA	**100%**
Future Projection (Unconstrained)	All wells	63	318	53	10	**444**
	Horizontal wells	16	1	0	0	**17**

1.2.2 Leasing Terminology

1.2.2.1 Standard Lease Terms

Standard Lease Terms are part of every lease issued by the BLM. Essentially, these terms establish that the lessee has the right to use as much of the leased lands as is necessary to explore, drill, and extract all the leased resource. They allow for reasonable measures that may be required to minimize adverse impacts to other resource values, land uses, or land users. To the extent consistent with the lease rights granted, these reasonable measures may include, but are not limited to, modification to siting or design of facilities, timing of operations, and specification of interim and final reclamation measures. However, under standard lease terms, the agency cannot require relocation of proposed operations by more than 200 meters, require that operations be sited off the leasehold, or prohibit new surface disturbing operations for more than 60 days annually. The lessee must comply with all laws and regulations regardless of the when the law was enacted and regardless of the effect it may have on the rights granted. The lessee also must comply with all Oil and Gas Onshore Orders.

1.2.2.2 Lease Stipulations

Lease stipulations are conditions placed on a lease that become part of the lease issued by BLM. The purpose of lease stipulations is to minimize potential adverse impacts of exploration and development operations in compliance with applicable management direction. Stipulations may be necessary to protect specific resources, even where such protection is not specifically mandated by existing laws or regulations. Lease stipulations may be modified only through the use of exceptions, modifications, or waivers that are documented in the lease file. Additional information related to lease stipulations and the specific stipulations considered by the Forest Service to meet the standards and guidelines of the WRNF Forest Plan (USFS 2002a) can be found in Section 1.4.6 of the WRNF Oil and Gas Leasing Final EIS (USFS 2014a).

The following brief summary of different types of stipulations and changes to those stipulations is derived from the Uniform Format for Oil and Gas Lease Stipulations (Rocky Mountain Regional Coordinating Committee 1989). A specific stipulation would apply to oil and gas exploration and development if the resource being protected by the stipulation occurs at the proposed well location, based on site-specific field evaluations.

No Surface Occupancy

The NSO stipulation is intended for use only when other stipulations are determined to be inadequate to protect surface resources. It is used to provide protection for surface resources when standard lease terms are inadequate, such as where the resource protection cannot be accomplished by relocating proposed operations less than 200 meters. The type of resource to be protected and the rationale for attaching the NSO stipulation must be stated in the lease file along with the location of the stipulation or percentage of the lease affected within the lease boundary.

Controlled Surface Use

The Controlled Surface Use stipulation is intended to be used to strictly control lease activities where resource protection cannot be accomplished adequately with mitigation measures provided by standard lease terms, regulations, and other guidance like Onshore Orders. It is less restrictive than NSO or Timing Limitation stipulations and should be applied where use and occupancy is allowed but special operational constraints are needed for specific types of activities that modify the lease rights but do not prohibit all activities. It also may be used to notify the lessee that operations may be moved more than 200 meters to minimize impacts to other resource values.

Timing Limitations

The Timing Limitation stipulation prohibits surface use during a specified period to protect identified resources and resource values on a seasonal basis. The specified period must exceed the maximum annual 60-day period allowed under standard lease terms. This stipulation does not apply to operation and maintenance of existing facilities.

Exceptions, Modifications and Waivers

Exceptions from stipulations can be issued on a case-by-case basis to temporarily exempt the lessee from lease stipulations because the conditions under which the stipulation was establish do not exist at the time of the exception. The acceptable causes for consideration of exceptions are stated in the applicable land use plan for the area.

Modifications are changes to the provisions of the lease stipulation, either temporarily or for the term of the lease. It may be needed if the conditions for which a stipulation was applied to a lease no longer occur. For example, if an NSO stipulation was established to protect a federally listed plant species, but a survey determines that the plant and its habitat do not exist, this may warrant modifying the lease to remove the NSO stipulation in that portion of the lease.

Waivers are permanent exemptions from a lease stipulation because the reason for implementing the stipulation is no longer applicable. Modifications and waivers are defined at 43 CFR 3101.1-4.

1.2.2.3 Lease Notice

A Lease Notice is a written notice from the authorized officer that serves to implement regulations not covered by stipulations or conditions of approval. It provides instructions on how to implement specific actions or items of local, regional, or state importance. Any requirements contained in a Lease Notice must be fully supported by law, regulations, Standard lease terms, or Onshore Orders, CFR 3101.3.

1.3 Purpose of the Action

BLM's purpose for this federal leasing action is to:

- Revisit or reaffirm previous BLM decisions to issue 65 leases underlying Forest Service lands. These leases were issued from 1995 to 2012 following the Forest Service's availability decision considered in the 1993 EIS (USFS 1993a);

- Assess conformance with the decisions making these lands available for oil and gas leasing in the 1993 EIS, as reaffirmed in the 2002 WRNF Plan and consider consistency with the Forest Service's recent availability decisions for lands within the WRNF;
- Support the Forest Service in managing oil and gas resources, as required by law and memoranda of understanding between the agencies; and
- Fulfill the federal government's policy to "foster and encourage private enterprise in the development of economically sound and stable industries, and in the orderly and economic development of domestic resources to help assure satisfaction of industrial, security, and environmental needs" (Mining and Minerals Policy Act of 1970) while continuing to sustain the land's productivity for other uses and capability to support biodiversity goals (Forest Service Minerals Program Policy).

1.4 Need for the Action

The BLM's need for this federal leasing action is to:

- Meet domestic energy needs under the requirements of the MLA, as amended, the Mining and Minerals Policy Act of 1970, and the Federal Onshore Oil and Gas Leasing Reform Act of 1987 ("Reform Act"). The BLM's responsibility under these laws is to regulate the development of oil and gas in the public domain, and to ensure that deposits of oil and gas owned by the U.S. shall be subject to disposition through the land use planning process.
- Address the NEPA deficiency identified by the 2007 IBLA ruling on the appeal by the Board of Commissioners of Pitkin County that BLM must formally adopt NEPA analysis completed by the Forest Service or conduct a NEPA analysis of its own for issuance of oil and gas leases underlying WRNF lands;
- Support Forest Service mineral policy that puts responsibility on field units, with the known presence or potential presence of a mineral or energy resource, to foster and encourage the exploration, development, and production of the mineral or energy resource consistent with Forest Service management direction; and
- Meet BLM's collaborative responsibility under the Reform Act to issue and manage oil and gas leases where the Forest Service has issued a land availability decision.

1.5 Decisions to be Made

1.5.1 Decisions to be Informed through this Analysis

This EIS considers 65 leases issued since 1993 in the WRNF. The decision to be made by the BLM, based on the analysis in this EIS, is whether the 65 leases should be:

1. Reaffirmed with their current existing stipulations;
2. Modified with additional or different lease stipulations or additional mitigation measures; or
3. Cancelled.

1.5.2 Decisions Beyond the Scope of this Analysis

The decision of whether NFS lands within the 65 existing leases are available or unavailable for oil and gas leasing remains with the Forest Service and is beyond the scope of this analysis, however, it should be noted that the BLM retains the ultimate discretion whether to issue a lease for any particular parcel (43 CFR 3101.7-2). In addition, this EIS will not directly affect decisions on any pending or proposed APDs because the Forest Service has the authority to address the NEPA on the proposed SUPO that accompany each APD.

The purpose of this EIS is to support a leasing decision with respect to the 65 previously issued leases. It will not authorize any development on these previously issued leases. Any discussion of development in this EIS is only to facilitate an analysis of the indirect effects of leasing through analysis assumptions based on historic oil and gas development in this region and the RFDS prepared for the WRNF that is included as Appendix F of the WRNF Oil and Gas Leasing Draft EIS (USFS 2012).

1.6 Relationship to Programs, Policies, and Plans

1.6.1 Major Laws and Regulations

The primary laws and regulations that affect fluid mineral leasing decisions on NFS lands are listed in **Table 1-3**. A variety of federal and state permits are required for development of oil and gas leases; however, none are listed because the decision for this EIS would not authorize development or any surface-disturbing activities. Additional details on laws and regulations that apply to leasing on NFS lands can be found in Section 1.4.1 of the WRNF Oil and Gas Leasing Final EIS (USFS 2014a).

Table 1-3 Major Federal Laws and Regulations Related to Oil and Gas Leasing

Law or Regulation	Brief Description	Agency
Organic Administration Act of 1897, 16, (U.S. Code [USC]) § 551	Authorizes the Secretary of Agriculture to promulgate rules and regulations for the use and occupancy of the National Forests.	Forest Service
Federal Land Policy and Management Act of 1976, 43 USC §§ 1701 et seq	BLM's organic act that defines the agency's mission as one of multiple use. It requires that BLM management allow for "a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and non-renewable resources" on public lands.	BLM
Multiple Use Sustained Yield Act of 1960, 16 USC § 528	Directed the national forests be managed under the principles of multiple use and to produce a sustained yield of products and services.	Forest Service
MLA, 30 USC §§ 181-287	Authorizes the Secretary of the Interior to issue leases for leasable minerals on public domain lands. Requires Secretary approval for proposed surface-disturbing activities within the lease area prior to issuance of a permit to drill on an oil and gas lease.	BLM
Federal Onshore Oil and Gas Leasing Reform Act of 1987, 30 USC §§181 et seq.	An amendment to the MLA important to federal leasing because it establishes the requirements for competitive leasing and grants the Forest Service the authority to make decisions and implement regulations concerning the leasing of oil and gas on NFS lands.	Forest Service, BLM
Mineral Leasing Act for Acquired Lands of 1947, 30 USC §§ 351 – 359	Extends leasing authority to lands that have been acquired by the federal government. Requires that the BLM obtain the consent of the Secretary of Agriculture) prior to lease issuance on acquired NFS lands.	BLM
Mining and Minerals Policy Act of 1970, 30 USC § 21a	Establishes the policy of the federal government to foster and encourage the orderly and economic development of domestic mineral resources in the national interest.	Forest Service, BLM

Table 1-3 Major Federal Laws and Regulations Related to Oil and Gas Leasing

Law or Regulation	Brief Description	Agency
Energy Security Act of 1980, 42 USC § 8855	Authorizes the Secretary of Agriculture to process applications for leases and permits for resource development on NFS lands, notwithstanding the current status of any Forest Plan.	Forest Service
Energy Policy Act of 2005	Directs the Secretaries of the Interior and Agriculture to improve administration of federal oil and gas leasing programs, inspection and enforcement of oil and gas activities, and the development and implementation of Best Management Practices (BMPs). Under this law, the Secretaries of the Interior and Agriculture developed a Memorandum of Understanding to improve coordination and consultation on oil and gas leasing activities and to establish joint policies and procedures for managing oil and gas leasing and subsequent actions.	Forest Service, BLM
National Forest Management Act (NFMA), 16 USC §§1600 et seq.	Requires the Forest Service to prepare a forest plan for each national forest.	Forest Service
NEPA, 42 USC §§ 4321 et seq. and Council on Environmental Quality – Regulations for Implementing NEPA (40 CFR §§ 1500 – 1508, 43 CFR Part 46)	Requires disclosure of the potential impacts of federal actions on the human environment to the decision makers and the public to ensure that informed decisions are based on science. Mandates public involvement in the process.	All federal agencies
Oil and Gas Resources on National Forests, 36 CFR § 228.100 – 116	Provides regulations for the leasing, permitting, operations, and management of oil and gas resources on NFS lands. Includes requirements for Forest Service analysis and approval of a SUPO, leasing analysis, and compliance.	Forest Service
Onshore Oil and Gas Orders, 43 CFR 3160	Onshore Order No.1 – Approval of Operations Onshore Order No. 2 – Drilling Operations Onshore Order No. 3 – Site Security Onshore Order No. 4 – Measurement of Oil Onshore Order No. 5 – Measurement of Gas Onshore Order No. 6 – Hydrogen Sulfide Operations Onshore Order No. 7 – Disposal of Produced Waters Onshore Order No. 8 – Well Completions/Workovers/Abandonment (Proposed Rule) Onshore Order No. 9 – Waste Prevention and Beneficial Use of Oil and Gas (Not Published)	BLM

1.6.2 BLM and Forest Service Land Use Plans

The most recent approved WRNF management plan is the LRMP 2002 revision (USFS 2002a), which provides objectives and management direction for oil and gas leasing, exploration, and development. The WRNF Oil and Gas Leasing Final EIS (USFS 2014a) analyzes potential amendment of the 2002 LRMP specific to oil and gas leasing availability. When the ROD is signed by the Forest Supervisor, it will amend the 2002 WRNF LRMP by making forest-wide decisions on oil and gas leasing land availability and approve lease stipulations to be attached to future leases for the purpose of protecting other resources.

The BLM generally divides the responsibility for leasing Forest Service lands by BLM field office (FO). The 65 leases analyzed in this EIS are located primarily within the jurisdiction of the BLM CRVFO and the BLM Grand Junction FO (GJFO), with one lease to the north within the jurisdiction of the BLM White River FO in Meeker, Colorado, in Rio Blanco County.

The BLM CRVFO document that guides its management decisions is the Resource Management Plan (RMP). The most recent fully approved RMP governing oil and gas development in the CRVFO area is the CRVFO RMP, which was approved in June 2015. Management of oil and gas leasing within the GJFO is guided by the Grand Junction RMP, approved in August 2015. The BLM WRFO recently prepared a RMP Amendment and EIS to address potential oil and gas exploration and development activities within the area it manages and amend the 1997 RMP. The ROD and Approved RMP was signed in August 2015.

1.7 Scoping, Public Involvement, and Relevant Issues Identified

1.7.1 Public Scoping

The scoping comment period began April 2, 2014, with the publication of the Notice of Intent (NOI) to prepare an EIS in the Federal Register (Vol. 79, No. 63, pages 18576 to 18577). The NOI notified the public of the BLM's intent to prepare an EIS for the Previously Issued Oil and Gas Leases in the WRNF and the beginning of a 30-day scoping period. The BLM also posted the NOI on the project website (http://www.blm.gov/co/st/en/fo/crvfo/existing_leases_on.html).

The BLM subsequently extended the comment period by 14 days. The scoping comment period ended on May 16, 2014. Additionally, the BLM mailed scoping notification letters to 23 stakeholders on or about April 2, 2014.

The BLM hosted four scoping meetings in April and May 2014 with an attendance (signed-in) totaling 772 people (**Table 1-4**).The meetings provided an opportunity for the BLM to inform those in attendance about the Proposed Action, conceptual alternatives, and the EIS process and to solicit input on the scope of the analysis and potential issues. Each meeting was held from 4:00 p.m. to 7:00 p.m. Attendees were greeted, asked to sign in, given a project fact sheet and comment form, and informed about the meeting agenda, the general flow of information (display boards) in the room, and ways to submit comments to the BLM, including the opportunity for oral comment. A sign-up sheet was provided for attendees wishing to provide oral comments at the meeting.

Table 1-4 Scoping Meeting Attendance

Date	Location	Signed-In Attendance
April 15, 2014	Glenwood Springs, CO (Glenwood Springs Community Center)	151
April 16, 2014	Carbondale , CO (Carbondale Town Hall)	286
April 17, 2014	Aspen, CO (Pitkin County Library)	95
May 1, 2014	De Beque, CO (De Beque Community Center)	240

The BLM received 32,318 comment documents, the majority of which were form letters submitted by individuals. Of all the comment documents (letters, emails, form letters, and meeting testimony), 3,275 were from commenters in Colorado, 25,929 were from other U.S. states, 471 were from outside the U.S., and 2,643 were from unknown locations.

All comments were read, categorized, and entered into a database. The detailed comments and a more in-depth discussion of the public scoping process can be found in the External Scoping Summary Report, February, 2015, which is available on the BLM project website at http://www.blm.gov/co/st/en/fo/crvfo/existing_leases_on.html.

1.7.2 Scoping Issues

Substantive scoping comments fell into the following four broad categories: Process, Purpose and Need, Alternatives Development, and Impacts Analysis (including resource-specific concerns and cumulative impacts). The primary public scoping issues are summarized in **Table 1-5** with the locations in this EIS where they are addressed.

Table 1-5 Summary of Primary Scoping Comments

Resource	Primary Scoping Comments	Resource Issues Analyzed in EIS
Process	What NEPA deficiencies exist and by what process should the BLM address them?	Sections 1.2 through 1.5
	By what authority may the BLM cancel or modify leases?	Sections 1.2 through 1.5
	How can cooperators, agencies with regulatory authority, affected stakeholders, and other interested parties participate during the NEPA process?	Section 1.7
Purpose and Need	Should the Purpose and Need for agency action extend beyond addressing a NEPA deficiency?	Sections 1.2 and 1.3
	How should the BLM balance the requirements of its multiple use mandate under Federal Land Policy and Management Act of 1976 and the need to maintain resource values with the need to respond to the requirements of the MLA?	Sections 1.2, 1.3, and 1.5
	What are BLM's and Forest Service's respective roles and decisions to be made?	Section 1.4
Analysis Approach (General)	What RFDS and other development assumptions should be used for EIS analysis? What level of analysis is appropriate for a lease sale EIS?	Section 4.1
	How should the BLM address changed circumstances and new information in a remedial NEPA process?	Chapter 1.0; Chapter 2.0; Section 4.1
Cumulative Impacts	What reasonably foreseeable future actions are appropriate for inclusion in the cumulative impact analyses?	Section 4.1
Air Quality	How would reasonably foreseeable development activities such as drilling, production, vehicle use, and other sources affect air quality?	Section 4.2
	How will the Proposed Action and alternatives address emissions of greenhouse gasses and potential contributions to climate change?	Section 4.2
	What methods or actions can minimize or mitigate air quality impacts and potential effects on human health and other resources from the Proposed Action and alternatives?	Chapter 2.0; Section 4.2
Geology and Minerals, including	What is the potential for seismic activity or other geological instability as a result of reasonably foreseeable development?	Section 4.3

Table 1-5 Summary of Primary Scoping Comments

Resource	Primary Scoping Comments	Resource Issues Analyzed in EIS
Paleontology	How would the potential for gas and liquid migration or seismic activity be affected by Mancos shale drilling, hydraulic fracturing, injection of produced water, or other reasonably foreseeable activities? How can those risks be minimized?	Sections 4.3 and 4.5
	What is the potential for impacts to important paleontological resources from reasonably foreseeable development and how can this be minimized?	Section 4.3
Soils	How does area soil type affect the potential for erosion, runoff, and subsequent sediment loading? What is the appropriate level of analysis for a leasing EIS?	Section 4.4
	How will impacts from reasonably foreseeable development to erodible soils, saline soils, or other sensitive soil types be minimized or mitigated?	Chapter 2.0; Section 4.4
Water Resources	How would the projected water use affect long-term availability of water sources?	Section 4.5
	How would the characteristics of the oil/gas formations, aquifer formations, and their interconnectedness affect water quality during activities such as drilling, hydraulic fracturing, or other reasonably foreseeable activities?	Sections 4.3 and 4.5
	What are appropriate setbacks for protection of public and private wells, lakes and streams, impaired waters, floodplains, or other water resources? What design features, BMPs, mitigation measures, and conditions of approval can be incorporated into the alternatives to reduce risk to water resources?	Chapter 2.0; Section 4.5
	How can the impacts from spills to water quality and other resources be minimized?	Chapter 2.0; Section 4.5
	How should water quantity and quality be monitored?	Section 4.5
Vegetation and Special Status Species	How will vegetation resources, plant diversity, and ecologically intact/undisturbed locations and special status plant species be protected from the impacts of reasonably foreseeable development and maintained?	Chapter 2.0; Section 4.6
	How would surface disturbance or changes in hydrology affect wetlands, riparian areas, and floodplains and how will these areas be protected?	Chapter 2.0; Section 4.7
	How would the potential spread of noxious weeds be mitigated?	Chapter 2.0; Section 4.6
Wildlife and Special Status Species	How would reasonably foreseeable habitat disturbance, vehicle use, and other elements of oil and gas development such as noise affect terrestrial and aquatic wildlife, special status species, and their habitat?	Sections 4.6, 4.7, and 4.8
	How will the Proposed Action and alternatives affect big game, including habitat fragmentation? How would these impacts affect big game hunting?	Section 4.7
	What stipulations or BMP, mitigation measures, or conditions of approval can be incorporated into the Proposed Action and alternatives to reduce risk to wildlife and special status species?	Chapter 2.0; Sections 4.6 and 4.7

Table 1-5 Summary of Primary Scoping Comments

Resource	Primary Scoping Comments	Resource Issues Analyzed in EIS
Cultural Resources	How can the BLM protect and conserve cultural resources, including Traditional Cultural Properties from reasonably foreseeable development?	Chapter 2.0; Section 4.9
	What cultural importance do local Tribes place on the analysis area, and how might important areas be affected?	Section 4.9
	How can the setting of historic tourism be maintained in consideration of reasonably foreseeable development?	Sections 4.9 and 4.13
Hazardous Materials	What types and amounts of hazardous materials will be used for oil and gas development? What methods will be used for hazardous materials transport, storage, and operations (including drilling and fracturing processes)? How will contaminants be disposed of? How will the BLM enforce compliance with safety requirements?	Section 4.16
	What contingencies exist to handle unexpected contaminations such as natural occurring radioactive materials or accidental spills and releases?	Section 4.16
Health and Human Safety	How will the BLM protect public health and safety in and around the analysis area?	Chapter 2.0; Section 4.16
	What are the cumulative and combined impacts of multiple exposures to chemicals and toxic substances such as hydraulic fracturing fluids, ozone, and volatile organic compounds on humans? How will exposure to these chemicals and substances be minimized for workers, area residents, and visitors?	Section 4.16
	How can the risk of wildland fire from human activity be reduced?	Section 4.16
	How will reasonably foreseeable development impact emergency and health care services?	Sections 4.16 and 4.17
	How can noise from oil and gas development activities and transportation be mitigated?	Sections 4.10 and 4.11
Land Use	How would the Proposed Action and alternatives comply with federal, county and local policies concerning development? How will county lands identified for protection in Master Plans be protected from reasonably foreseeable development?	Section 4.11
Livestock Grazing	How will the BLM minimize impacts to livestock in and around the analysis area from exposure to hydraulic fracturing fluids, fugitive dust, and as well as impacts from noise or traffic?	Section 4.14
Recreation	How would reasonably foreseeable activities affect access to recreation and the quality of the recreational experience? How would this affect the recreation industry? How will effects be minimized?	Sections 4.13 and 4.17
	What are the hunting and fishing values of lands and waters in the analysis area? How would those activities be affected by potential development?	Sections 4.13 and 4.17
Socioeconomics	Would reasonably foreseeable development be compatible with the varying social and economic conditions across the analysis area, including employment patterns, and preferences for oil and gas development versus other industries?	Section 4.17

Table 1-5 Summary of Primary Scoping Comments

Resource	Primary Scoping Comments	Resource Issues Analyzed in EIS
	How would lease cancellation affect local and regional social and economic conditions? How would lease cancellation affect operators or recipients of past royalties?	Section 4.17
	How would lease reaffirmation affect social and economic conditions on local and regional levels?	Section 4.17
	How would resource conservation measures and other actions that would restrict or limit oil and gas development (such as modifying leases) affect social and economic conditions?	Section 4.17
	What mitigation strategies can be used to minimize adverse social or economic impacts?	Section 4.17
Special Designations	How would the Proposed Action and alternatives comply with the 2001 and 2012 Roadless Rules? How would the alternatives affect the wilderness qualities of inventoried roadless areas and the values of research natural areas? What measures may be implemented to reduce those impacts?	Chapter 2.0; Section 4.12
	How would the values of other special designations such be protected?	Chapter 2.0; Section 4.12
Transportation	How will development affect local and regional access and traffic on a daily and annual basis? How will adverse impacts to traffic be minimized?	Chapter 2.0; Section 4.10
	How will reasonably foreseeable development affect the local road system? How will the BLM coordinate with counties on road development? How will adverse impacts to the local transportation network be minimized?	Section 4.10
Visual Resources	How would the reasonably foreseeable development affect the general landscape and rural character of the area under each of the alternatives? How will adverse impacts to areas with high quality visual resources be minimized?	Chapter 2.0; Section 4.15
	How will the construction and operation activities affect visibility (haze) from Class I and sensitive Class II areas and important recreational facilities?	Sections 4.2 and 4.13

1.7.3 Internal Scoping

Following review of the public scoping comments, the BLM CRVFO interdisciplinary team met to discuss the external scoping comments and to formulate alternatives to be analyzed in the EIS. This meeting was held to identify issues of concern to the BLM and to discuss how to address the public and agency issues in the EIS. The meeting also helped to more fully develop the conceptual alternatives that were presented in the NOI.

1.7.4 Consultation and Coordination with Federal, State, and Local Governments, and Federally Recognized Indian Tribes

1.7.4.1 Cooperating Agencies

The BLM invited 23 federal and state agencies, counties, tribes, and municipalities to become cooperating agencies in letters sent to each organization on July 3, 2014. To date, 11 agencies and local governments have accepted the invitation to be a cooperating agency, listed below.

- WRNF
- U.S. Environmental Protection Agency, Region 8
- Colorado Division of Natural Resources
- Garfield County Commissioners
- Mesa County Commissioners
- Pitkin County Commissioners
- Rio Blanco County Commissioners
- Town of Carbondale
- City of Glenwood Springs
- City of Rifle
- Town of Silt

Cooperating Agency meetings are held at the CRVFO every few months or as needed to obtain comments from the cooperating agency representatives. This input includes comments on the types of information and data they can provide to support the NEPA process, comments on the preliminary range of alternatives, and reviews of sections of the EIS related to their special expertise.

1.7.4.2 Tribal Government-to-Government Consultation

Federal agencies are responsible for compliance with a host of laws, Executive Orders and Memoranda, treaties, departmental policies, and other mandates regarding their legal relationships with and responsibilities to Native Americans. Initially, the BLM CRVFO Field Manager sent scoping letters to the Ute Indian Tribe, the Ute Mountain Ute Tribe, and the Southern Ute Indian Tribe in April 2014, to notify them about the Previously Issued Oil and Gas Leases in the WRNF EIS, inviting their comments and participation as cooperating agencies. Comments were received from the Southern Ute Indian Tribe.

On July 3, 2014, the BLM Field Manager sent letters to the Ute Indian Tribe, the Ute Mountain Ute Tribe, and the Southern Ute Indian Tribe to invite them to participate as cooperating agencies in the development of the EIS. No responses were received from the tribes.

Formal government-to-government consultation was initiated on June 1, 2015, when the BLM Field Manager sent letters to the tribes requesting that they provide comments or concerns regarding the effects of the alternatives on the known and likely traditional cultural properties, and offering the opportunity for face-to-face meetings with the Forest Service or the BLM. To date, no responses have been received. More detail on consultation is provided in Chapter 5.0 of this EIS.

1.8 Organization of this EIS

Chapter 1.0 of the EIS provides an introduction and general overview of the proposed federal action. In addition, this chapter describes the purpose of and need for the Proposed Action; the decisions to be made; existing BLM and Forest Service policies, plans, and programs; relevant laws, and regulations; and a summary of outreach activities.

Chapter 2.0 provides a summary of the EIS alternatives; a summary of the alternatives eliminated from detailed analysis and the reasons for elimination; detailed descriptions of the alternatives analyzed in the EIS; a summary of environmental protection measures and agency-required measures; and a comparison of impacts under each alternative.

Chapter 3.0 describes the existing natural and human environment within the proposed project area, focusing on the conditions that may be affected by the alternatives analyzed in detail.

Chapter 4.0 describes the potential direct and indirect impacts to the natural and human environment that would result from the implementation of the EIS alternatives. At the end of each resource section, there is a discussion of the cumulative impacts that would result from the implementation of the alternatives, in combination with the impacts contributed by other past and present actions and reasonably foreseeable future actions. This chapter also discusses the relationship between short-term uses of the human environment and the maintenance and enhancement of long-term productivity, and irreversible and irretrievable commitment of resources.

Chapter 5.0 provides a summary of the public involvement process; a summary of consultation and coordination undertaken to prepare the EIS; a list of federal, state, and local agencies, tribes, and private organizations and companies that were contacted during the preparation of the EIS; agencies, organizations, and persons to whom copies of the EIS were sent; and the lists of BLM and consultant team members that developed the EIS.

Following Chapter 5.0 is the list of references cited in the EIS, a glossary of terms the readers can use to obtain definitions for scientific or technical terms, an index of key terms and information presented in the EIS, and technical appendices.

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2.0 Alternatives Including the Proposed Action

2.1 Introduction

This chapter describes the alternatives considered in this Environmental Impact Statement (EIS). According to the Regulations for Implementing the Procedural Provisions of National Environmental Policy Act (NEPA) by the Council on Environmental Quality, the alternatives section is the heart of the EIS (40 Code of Federal Regulations [CFR] § 1502.14). Reasonable alternatives to be analyzed in detail must be developed based on the purpose and need for the action, be consistent with federal laws, and not be speculative. Per BLM regulations at 43 CFR § 46.420(b), reasonable alternatives are those "that are technically and economically practical or feasible and meet the purpose and need of the proposed action." All alternatives analyzed in detail in an EIS must be rigorously explored, objectively evaluated, and considered by the decision-maker. The alternatives should be developed to analyze a reasonable range of possibilities that cover the full spectrum of the issues to be evaluated and compared, without requiring every possible combination of options to be considered.

These alternatives were developed by the Bureau of Land Management (BLM) in response to issues and concerns from public comments submitted during the public scoping period, coordination with Cooperating Agencies, and interaction with the BLM management and resource specialists. The BLM also considered alternatives raised during the scoping and alternatives development processes that are not carried forward for detailed analysis. These alternatives, with the rationale for not including each for detailed analysis, are described in Section 2.4.

In addition to the No Action Alternative, there are four action alternatives analyzed in detail. This chapter concludes with a summary of the environmental effects of the alternatives that are analyzed in the EIS.

The Council on Environmental Quality regulations at 40 CFR § 1502.14(e) direct that an EIS "…identify the agency's preferred alternative or alternatives, if one or more exists, in the draft statement and identify such alternative in the final statement unless another law prohibits the expression of such a preference." The BLM has not yet selected a preferred alternative for inclusion in this Draft EIS, but, per BLM regulations at 43 CFR § 46.425, the BLM will identify a preferred alternative in the Final EIS based on the range of alternatives and input from the public during the Draft EIS public comment period. The identification of a preferred alternative does not constitute a commitment or decision in principle, and there is no requirement to select the preferred alternative in the Record of Decision (ROD). Selection in the ROD of an alternative other than the preferred alternative does not require preparation of a supplemental EIS if the selected alternative was analyzed in the EIS.

2.2 Summary of Alternatives Analyzed in Detail

Following is a brief summary of the alternatives analyzed in detail in this EIS.

- **Alternative 1 (No Action Alternative)**—Reaffirms the lease stipulations on the 65 leases as they were issued.
- **Alternative 2**—Modifies leases to address inconsistencies with the 1993 EIS and ROD (U.S. Forest Service [Forest Service or USFS] 1993a). Adds stipulations identified in the 1993 EIS and ROD but not attached to leases as issued.
- **Alternative 3**—Modifies the 65 leases to match the stipulations for future leasing identified in the Proposed Action from the 2014 White River National Forest (WRNF) Final EIS (USFS 2014a).

- **Alternative 4 (Proposed Action)**—Modifies or cancels the 65 leases to match the stipulations and availability decisions identified for future leasing in the 2014 WRNF Draft ROD (USFS 2014b).
- **Alternative 5**—Cancels all 65 existing leases; plug and abandon producing wells; remove roads, well pads, and ancillary facilities; and reclaim all disturbed areas.

2.3 Alternatives Analyzed in Detail

2.3.1 Alternative 1 (No Action Alternative): Reaffirm Leases with Current Stipulations

Under Alternative 1, the BLM would continue to administer the leases with their current stipulations. Those leases that are currently under suspension would be reaffirmed and allowed to be developed at the discretion of the lessee, subject to applicable legal requirements. Should a lease be reinstated, the process for management of exploration, development, and reclamation would continue to follow the process described in Section 1.1.3. Throughout this document, the term “development” is used to describe the construction, drilling, and completion processes necessary to produce fluid minerals. Once development is completed, mineral extraction to produce the well is described as “operations.”

As shown in **Table 2-1**, most of the leases not under suspension are within a designated unit or held by production. **Table 2-1** summarizes the stipulations by lease under Alternative 1. The stipulations are displayed in **Figures 2-1** through **2-4**.

Table 2-1 Lease Stipulations Under Alternative 1

Zone	Lease No.	Lease Acres	Type of Stipulation [1]	Type of Restriction	Acres of Stipulation/SLT
1	058677	543	NSO	Roadless Areas	543
1	059630	587	NSO	Bighorn Sheep	309
				Roadless Areas	587
				Slopes Greater than 60%	587
1	066727	640	NSO	Bighorn Sheep	640
1	066728	1,276	NSO	Bighorn Sheep	1,276
			TL	Big Game Winter Range	93
1	066729	654	NSO	Bighorn Sheep	653
				Slopes Greater than 60%	1
1	066730	1,279	NSO	Bighorn Sheep	1,278
			SLT ONLY	Standard Lease Terms	1
1	066731	651	NSO	Slopes Greater than 60%	651
1	066732	1,437	NSO	Slopes Greater than 60%	1435
1	066733	1,416	NSO	Slopes Greater than 60%	1,418
1	066926	1,629	NSO	Slopes Greater than 60%	1,629
2	061121	964	NSO	Slopes Greater than 60%	351
			TL	Big Game Winter Range	208
			SLT ONLY	Standard Lease Terms	405
2	066723	1,280	NSO	Slopes Greater than 60%	68
			TL	Big Game Winter Range	1,198
			SLT ONLY	Standard Lease Terms	82

Table 2-1 Lease Stipulations Under Alternative 1

Zone	Lease No.	Lease Acres	Type of Stipulation [1]	Type of Restriction	Acres of Stipulation/SLT
2	066724	1,973	TL	Big Game Winter Range	1,973
2	066915	2,537	NSO	USFS Administrative Sites	108
			TL	Big Game Winter Range	2,348
				Elk Production Area	80
			SLT ONLY	Standard Lease Terms	1
2	066916	2,562	TL	Elk Production Area	1,901
			SLT ONLY	Standard Lease Terms	660
2	066917	1,920	NSO	High Geologic Hazard—GMUGNF	20
			CSU	Elk Production Area—GMUGNF	439
			TL	Elk Production Area	443
			SLT ONLY	Standard Lease Terms	1,018
2	066918	2,557	NSO	Slopes Greater than 60%	216
			CSU	Level 1 Travel Route	98
			TL	Big Game Winter Range	2,531
2	066920	418	NSO	Slopes Greater than 60%	32
			SLT ONLY	Standard Lease Terms	386
2	067147	783	NSO	Slopes Greater than 60%	771
			TL	Big Game Winter Range	11
			SLT ONLY	Standard Lease Terms	1
2	067150	662	NSO	Slopes Greater than 60%	207
			TL	Big Game Winter Range	385
			SLT ONLY	Standard Lease Terms	70
2	067542	480	NSO	Slopes Greater than 60%	435
			SLT ONLY	Standard Lease Terms	46
2	067543	1,167	NSO	Slopes Greater than 60%	800
			SLT ONLY	Standard Lease Terms	367
2	067544	730	NSO	Slopes Greater than 60%	730
2	070013	1,262	NSO	>60% Slope—GMUGNF	1
				High Geologic Hazard—GMUGNF	52
				Riparian/ Wetland—GMUGNF	3
				Roadless Area—GMUGNF	186
				Slopes Greater than 60%	1,037
			CSU	40-60% Slope—GMUGNF	33
				Moderate Geologic Hazard—GMUGNF	173
2	070014	1,486	NSO	Roadless Areas	1,486
				Slopes Greater than 60%	1,486

Table 2-1 Lease Stipulations Under Alternative 1

Zone	Lease No.	Lease Acres	Type of Stipulation [1]	Type of Restriction	Acres of Stipulation/SLT
2	070015	1,598	NSO	Roadless Areas	1,522
				Slopes Greater than 60%	1,522
			SLT ONLY	Standard Lease Terms	76
2	070016	51	NSO	Slopes Greater than 60%	50
2	070361	638	NSO	Slopes Greater than 60%	556
			CSU	Moderate Geologic Hazard—GMUGNF	47
				Powerline Corridor	35
			TL	Big Game Winter Range	35
				Big Game Winter Range—GMUGNF	47
2	072157	638	NSO	Slopes Greater than 60%	15
			CSU	Moderate Geologic Hazard—GMUGNF	341
				Powerline Corridor	185
			TL	Big Game Winter Range	201
				Big Game Winter Range—GMUGNF	341
			SLT ONLY	Standard Lease Terms	82
2	075070	1,152	NSO	Roadless Areas	1,147
				Slopes Greater than 60%	248
			TL	Big Game Winter Range	950
				Elk Production Area	249
			SLT ONLY	Standard Lease Terms	5
2	076123	80	NSO	Roadless Areas	80
3	058835	1,475	SLT ONLY	Standard Lease Terms	1,475
3	058836	1,279	SLT ONLY	Standard Lease Terms	1,279
3	058837	1,669	TL	Elk Production Area	1,669
3	058838	1,277	CSU	Areas of Moderate Geologic Hazard—GMUGNF	26
			SLT ONLY	Standard Lease Terms	1,251
3	058839	1,127	TL	Elk Production Area	1,086
			SLT ONLY	Standard Lease Terms	41
3	058840	639	TL	Snowmobile	8
			SLT ONLY	Standard Lease Terms	631
3	058841	638	TL	Snowmobile	58
			SLT ONLY	Standard Lease Terms	580
3	066687	1,053	NSO	Slopes Greater than 60%	46
			SLT ONLY	Standard Lease Terms	1,007
3	066688	774	NSO	Slopes Greater than 60%	65
			TL	Elk Production Area	174
			SLT ONLY	Standard Lease Terms	535

Table 2-1 Lease Stipulations Under Alternative 1

Zone	Lease No.	Lease Acres	Type of Stipulation [1]	Type of Restriction	Acres of Stipulation/SLT
3	066689	40	NSO	Ski Area	40
3	066690	274	NSO	Ski Area	36
			CSU	Level 1 Travel Route	49
			TL	Elk Production Area	142
				Snowmobile	49
			SLT ONLY	Standard Lease Terms	47
3	066691	198	NSO	Cutthroat Trout	39
				Slopes Greater than 60%	98
			SLT ONLY	Standard Lease Terms	61
3	066692	1,417	NSO	Slopes Greater than 60%	91
			SLT ONLY	Standard Lease Terms	1,327
3	066693	2,167	NSO	Slopes Greater than 60%	365
			TL	Big Game Winter Range	80
				Elk Production Area	1,169
			SLT ONLY	Standard Lease Terms	552
3	066694	119	NSO	Cutthroat Trout	2
				Slopes Greater than 60%	92
			SLT ONLY	Standard Lease Terms	25
3	066695	1,061	NSO	Big Game Winter Range	277
				Slopes Greater than 60%	97
			SLT ONLY	Standard Lease Terms	688
3	066696	1,027	NSO	Cutthroat Trout	206
			SLT ONLY	Standard Lease Terms	821
3	066697	1,872	NSO	Cutthroat Trout	217
			SLT ONLY	Standard Lease Terms	1,655
3	066698	2,460	SLT ONLY	Standard Lease Terms	2,460
3	066699	114	SLT ONLY	Standard Lease Terms	114
3	066700	841	NSO	Slopes Greater than 60%	370
			SLT ONLY	Standard Lease Terms	471
3	066701	1,885	NSO	Cutthroat Trout	62
				Slopes Greater than 60%	34
			SLT ONLY	Standard Lease Terms	1,789
3	066702	1,254	NSO	Slopes Greater than 60%	822
			SLT ONLY	Standard Lease Terms	432
3	066706	2,548	SLT ONLY	Standard Lease Terms	2,547
3	066707	1,276	NSO	Slopes Greater than 60%	109
			SLT ONLY	Standard Lease Terms	1,167

Table 2-1 Lease Stipulations Under Alternative 1

Zone	Lease No.	Lease Acres	Type of Stipulation [1]	Type of Restriction	Acres of Stipulation/SLT
3	066708	2,554	CSU	Level 1 Travel Route	984
			TL	Elk Production Area	1,239
			SLT ONLY	Standard Lease Terms	1,315
3	066709	638	SLT ONLY	Standard Lease Terms	638
3	066710	2,329	CSU	Level 1 Travel Route	538
			TL	Snowmobile	1,241
			SLT ONLY	Standard Lease Terms	1,088
3	066711	1,751	CSU	Level 1 Travel Route	1,286
			TL	Elk Production Area	1,727
			SLT ONLY	Standard Lease Terms	24
3	066712	875	NSO	Cutthroat Trout	70
			CSU	Level 1 Travel Route	100
			TL	Elk Production Area	617
			SLT ONLY	Standard Lease Terms	188
3	066908	2,400	TL	Elk Production Area	1,929
			SLT ONLY	Standard Lease Terms	472
3	066909	2,077	NSO	Cutthroat Trout	3
				Slopes Greater than 60%	255
			TL	Big Game Winter Range	206
				Elk Production Area	190
			SLT ONLY	Standard Lease Terms	1,424
3	066913	1,660	NSO	Slopes Greater than 60%	53
			CSU	Level 1 Travel Route	402
			TL	Snowmobile	301
			SLT ONLY	Standard Lease Terms	1,134
4	066948	2,562	NSO	Slopes Greater than 60%	65
			TL	Big Game Winter Range	405
				Snowmobile	1,569
			SLT ONLY	Standard Lease Terms	524

[1] GMUGNF= Grand Mesa, Uncompahgre, and Gunnison National Forest.
NSO = No Surface Occupancy.
CSU = Controlled Surface Use.
TL = Timing Limitation.
SLT = Standard Lease Terms.

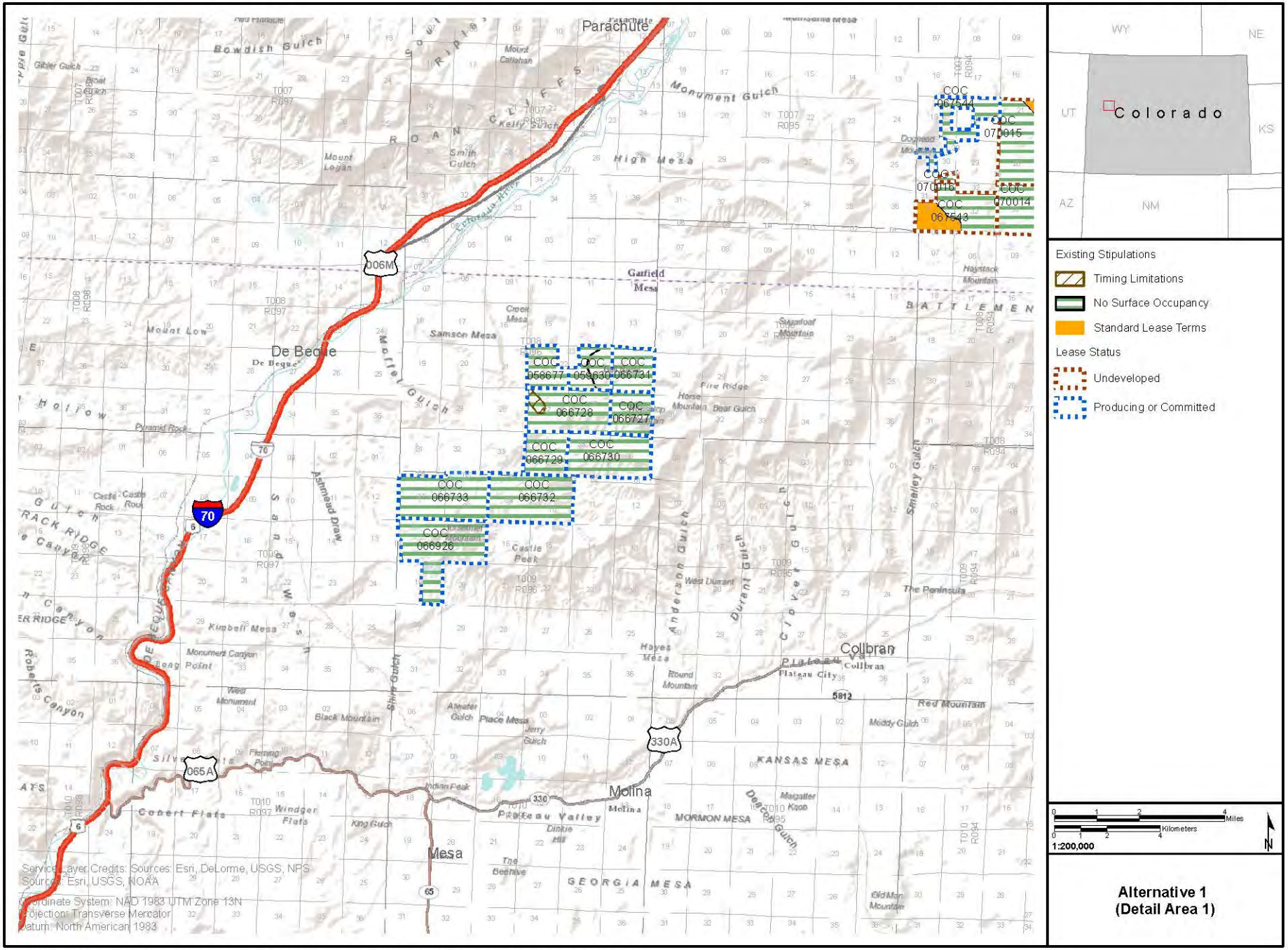

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Figure 2-1 Existing Lease Stipulations under Alternative 1, West Side

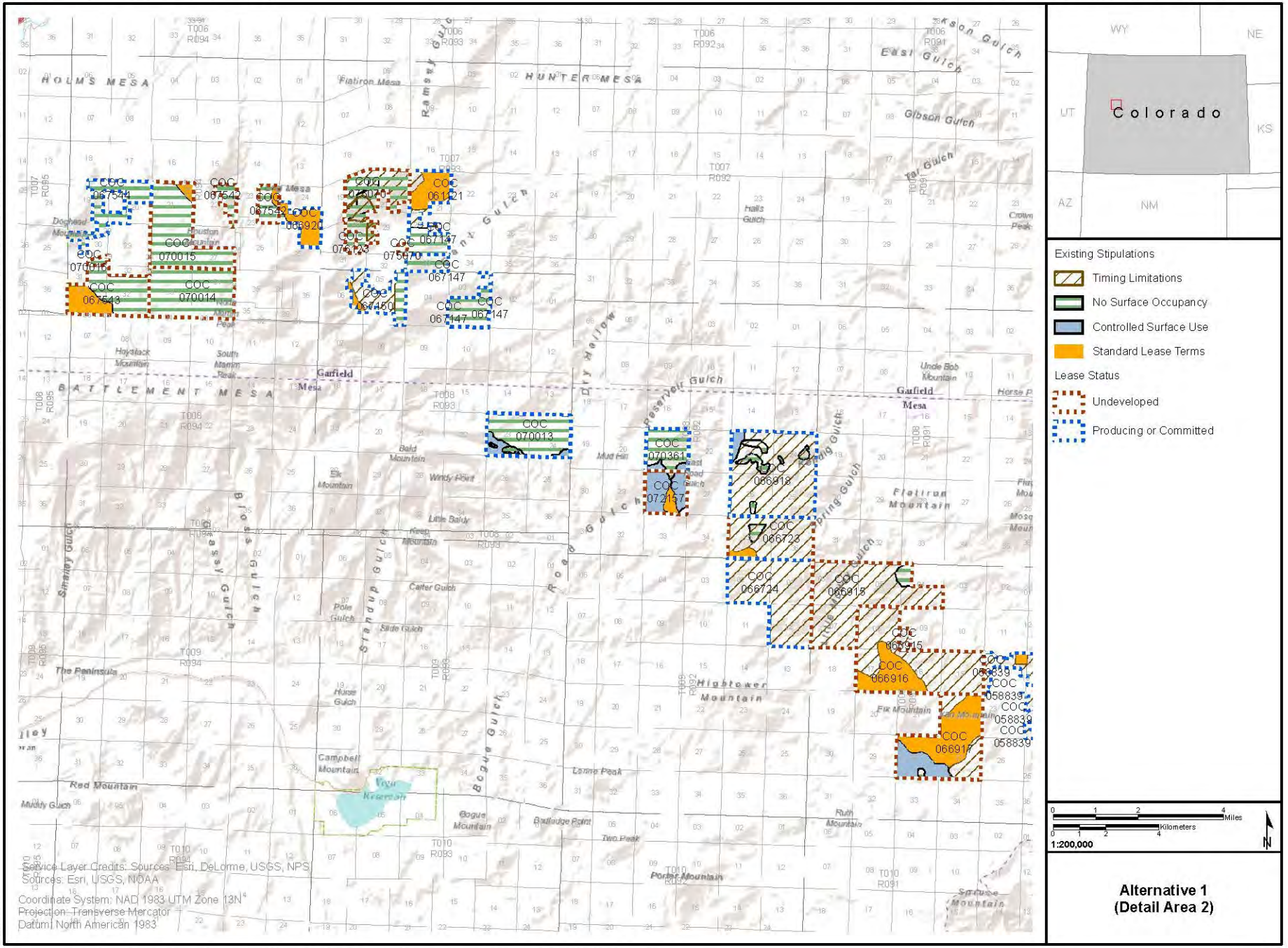

Figure 2-2 Existing Lease Stipulations under Alternative 1, Middle Section

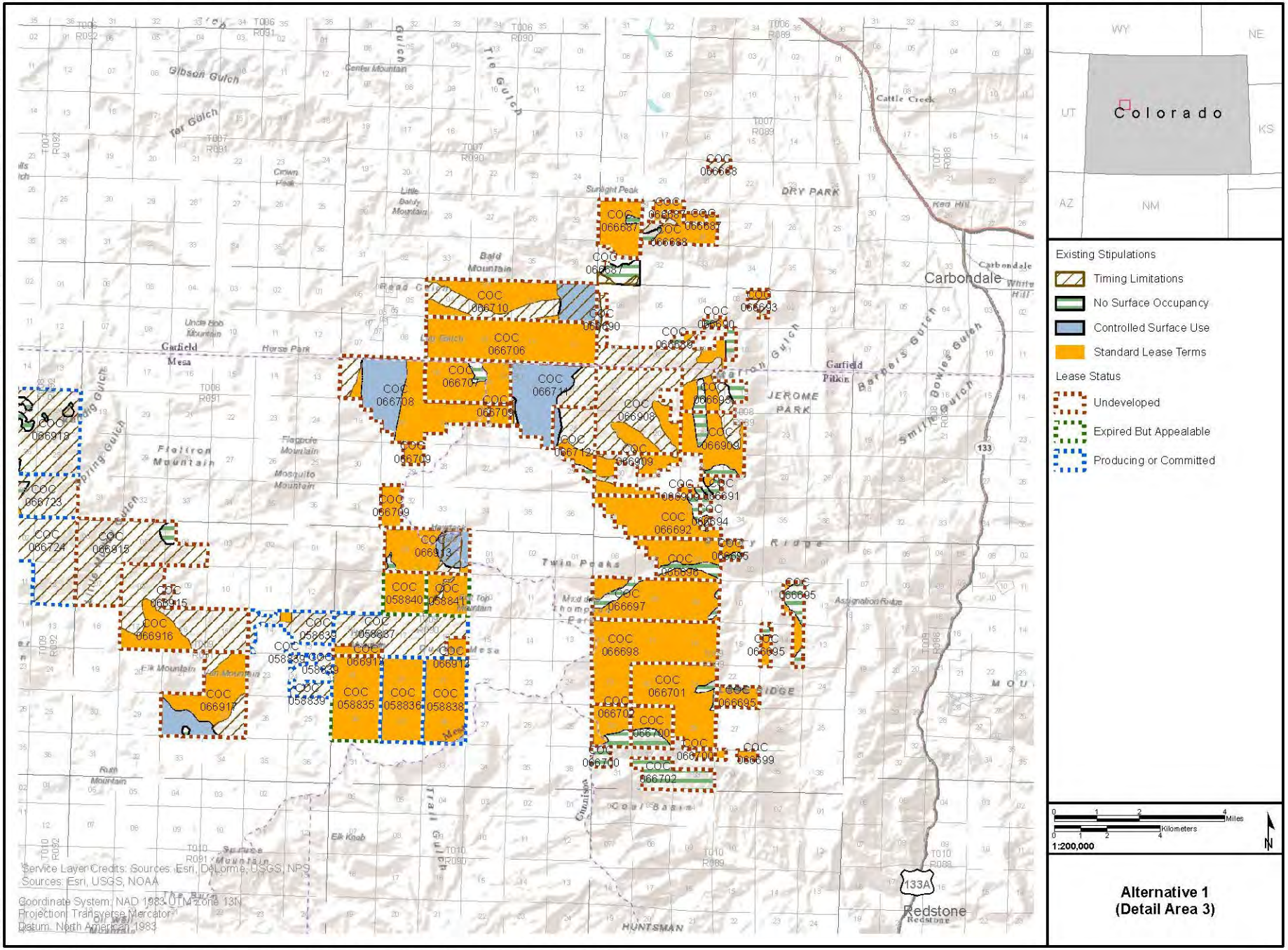

Figure 2-3 Existing Lease Stipulations under Alternative 1, East Side

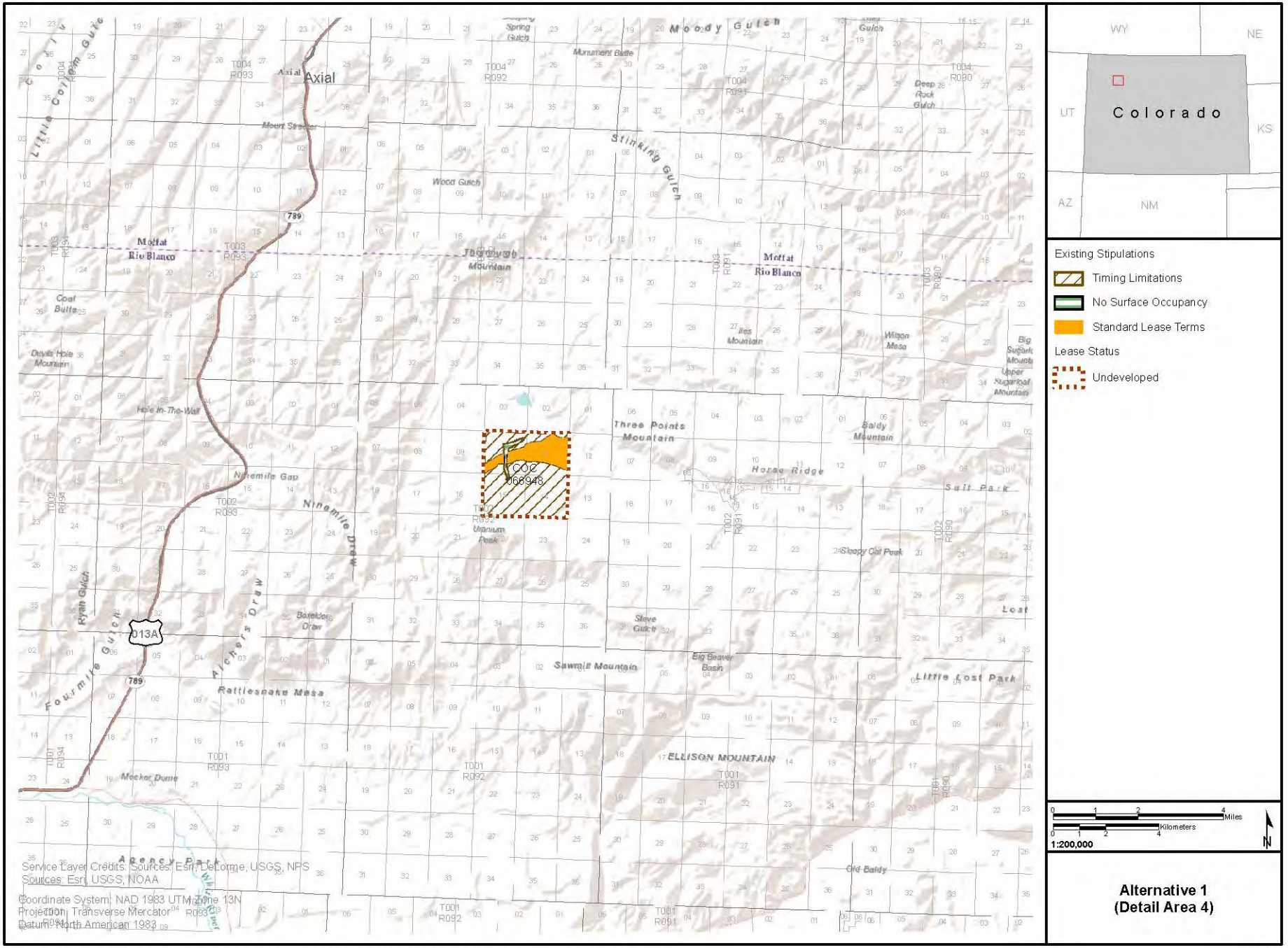

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Figure 2-4 Existing Lease Stipulations under Alternative 1, North Lease

2.3.2 Alternative 2: Update to Include All 1993 Leasing Decisions

Alternative 2 addresses inconsistencies between the 1993 WRNF ROD and the lease stipulations as they were subsequently issued. In some cases, the leases did not include the stipulations as stated in the Forest Service decision document; these leases would be modified to include those stipulations under this alternative. Under this alternative, the BLM would offer the lessee the option of either accepting the new lease terms or having the lease cancelled. Cancellation would be done through a BLM administrative process and would require that the BLM refund any bonus bids and lease payments.

This alternative applies only to eight leases and is intended to reconcile differences in the stipulations by adding the stipulations listed in **Table 2-2**. All other lease stipulations are the same as those shown in **Table 2-1**. Only the additional lease stipulations are shown on **Figures 2-5** through **2-8**.

Table 2-2 Leases with Additional Stipulations to Correct Known Discrepancies

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction	Acres of Stipulation
3	058840	639	TL	Snowmobile Corridor	80
3	058841	638	TL	Snowmobile Corridor	269
3	066687	1,053	NSO	Slopes Greater than 60%	399
			TL	Elk Production Area	382
3	066688	774	NSO	Slopes Greater than 60%	17
3	066693	2,167	NSO	Ski Area	27
3	066706	2,548	CSU	Level 1 Travel Route	793
			NSO	Slopes Greater than 60%	74
			TL	Unspecified	336
				Level 1 Travel Route	793
3	066707	1,276	TL	Unspecified	133

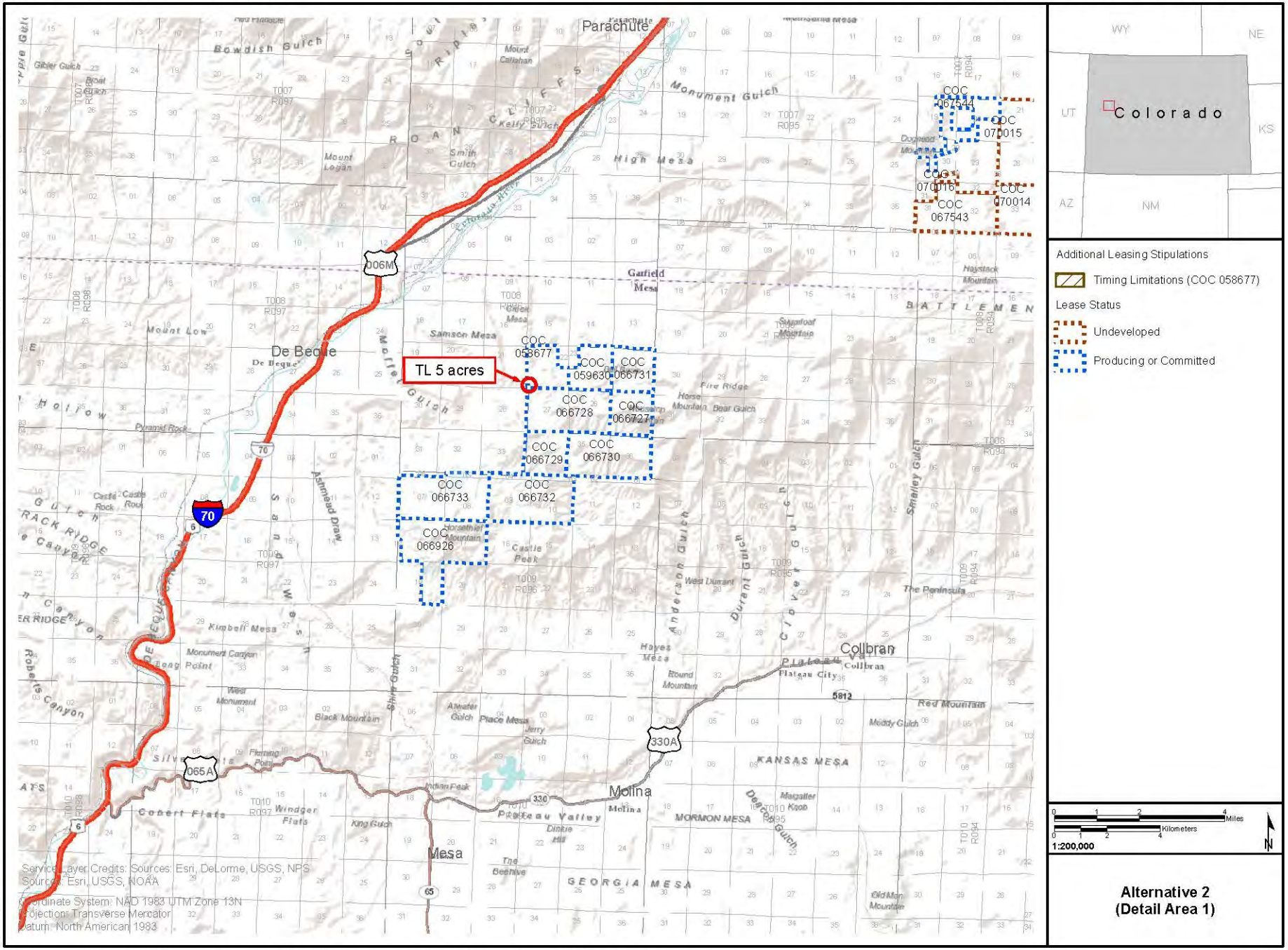

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Figure 2-5 Additional Lease Stipulations under Alternative 2, West Side

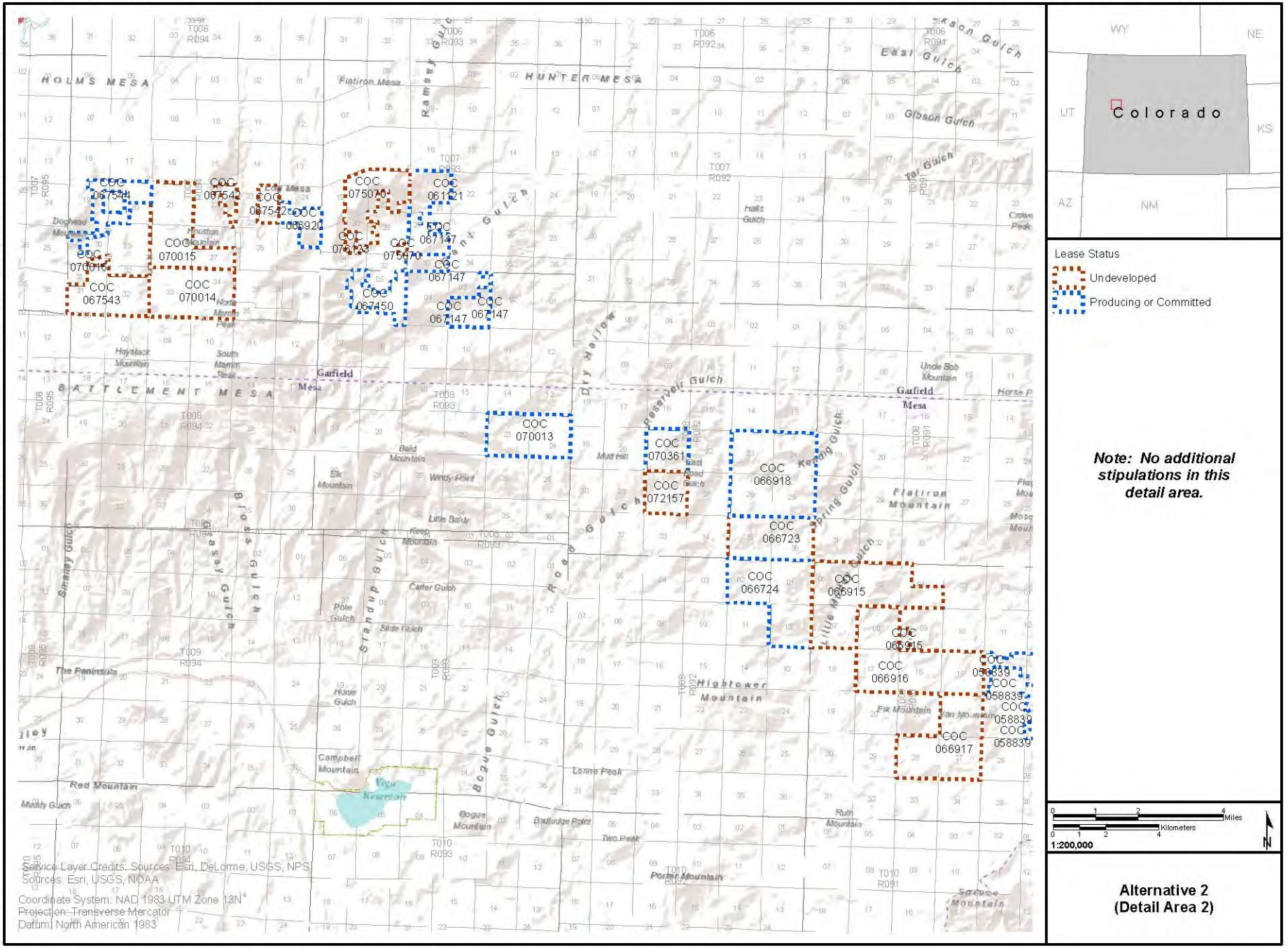

Figure 2-6 Additional Lease Stipulations under Alternative 2, Middle Section

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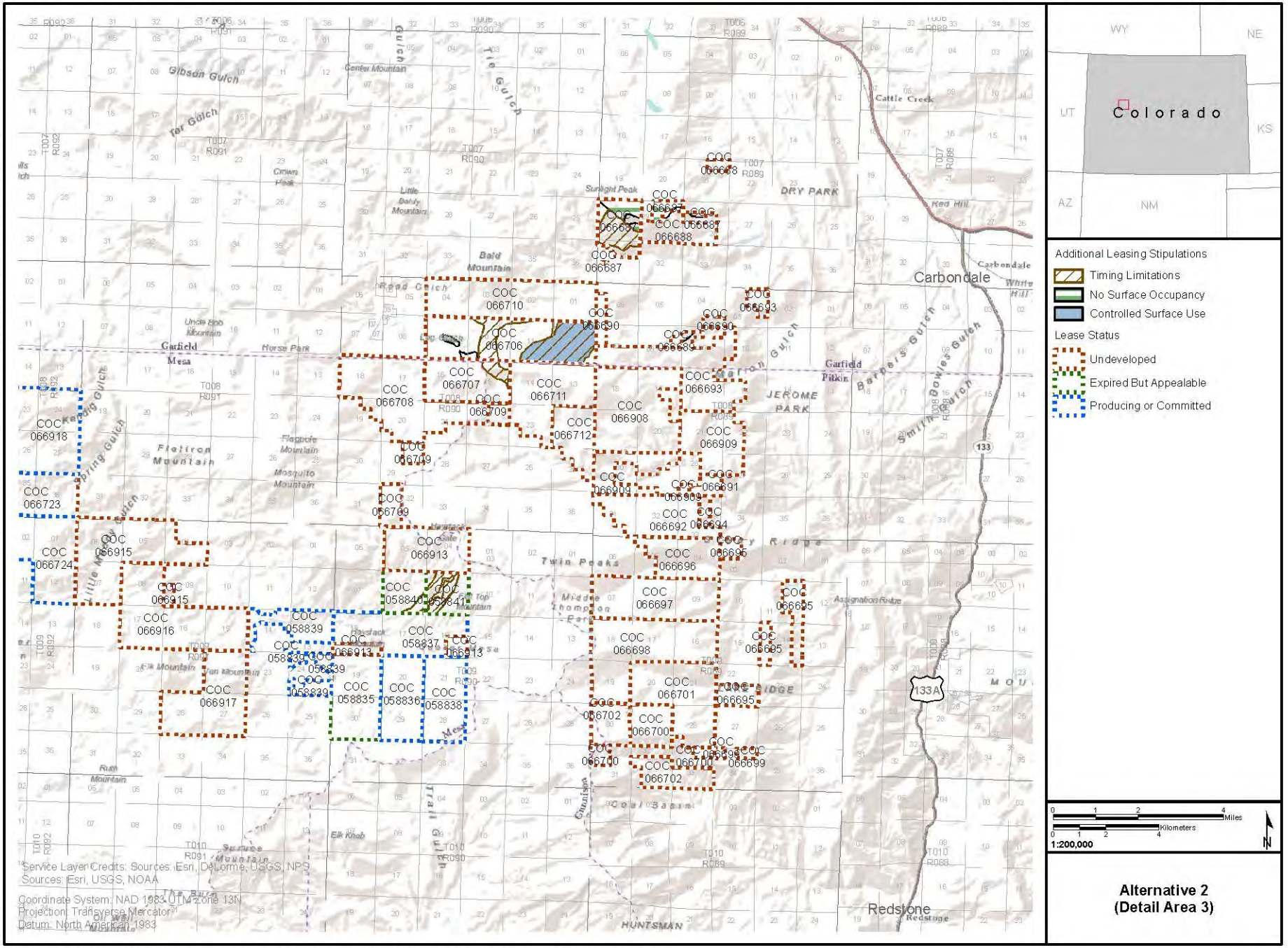

Figure 2-7 Additional Lease Stipulations under Alternative 2, East Side

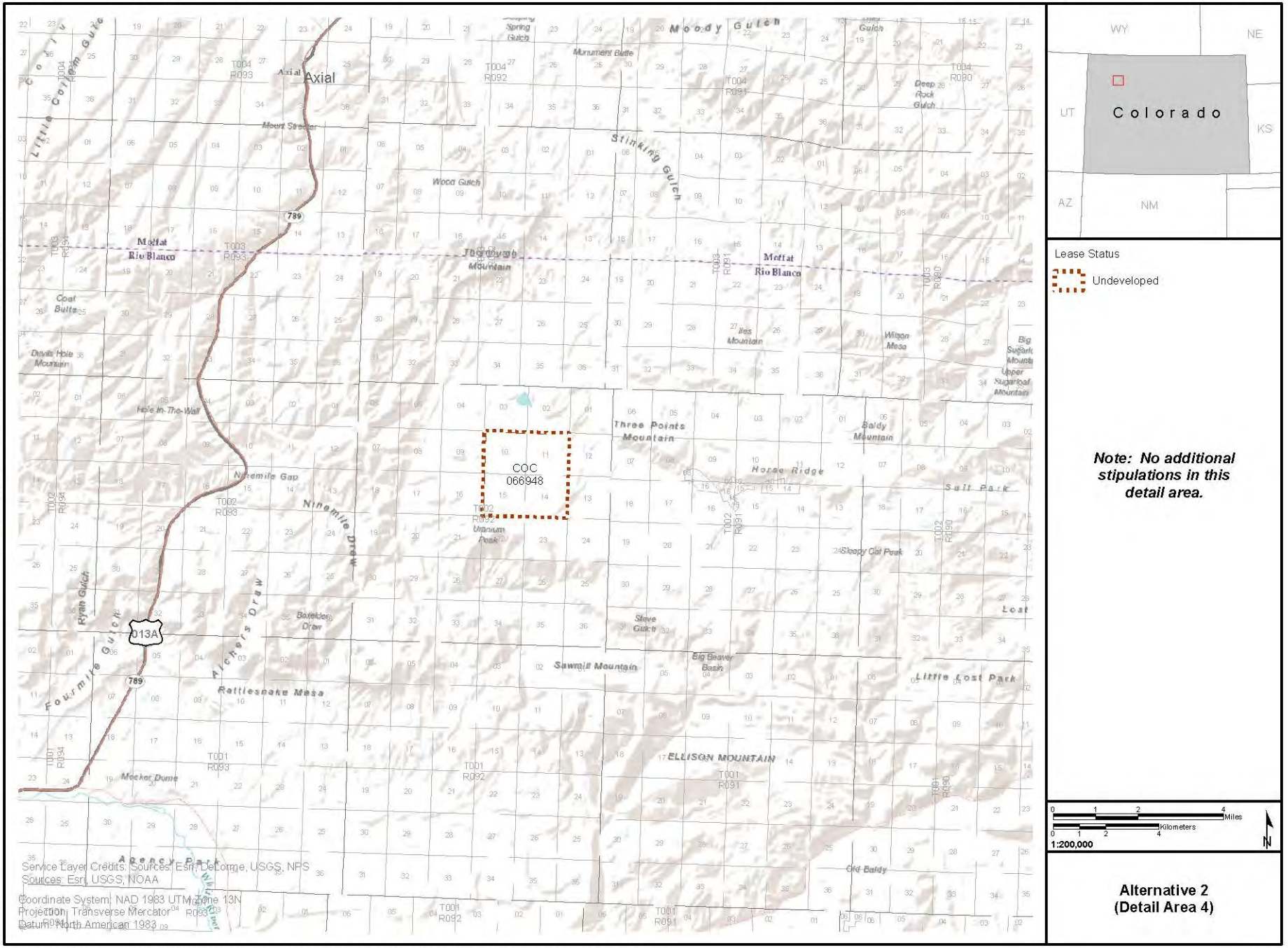

Figure 2-8 Additional Lease Stipulations under Alternative 2, North Side

2.3.3 Alternative 3: Modify Stipulations to Match the 2014 WRNF Final EIS Proposed Action

Although the Forest Service's 2014 Proposed Action and draft decision do not apply to these 65 leases, Alternative 3 is designed to consider the modification of the 65 leases to match the stipulations for future leasing in the Forest Service's Proposed Action from the WRNF Final EIS (USFS 2014a). Under Alternative 3, the BLM would modify the existing leases to apply stipulations that match those identified by the Forest Service for future leasing in its Proposed Action. Under this alternative, the BLM would offer the lessee the option of either accepting the new lease terms or having the lease cancelled. For undeveloped leases, cancellation (if elected by the lessee) would be done through a BLM administrative process and would require that the BLM refund any bonus bids and lease payments. Should the lessee not accept the new lease stipulations on a producing lease, it may be necessary for the BLM to request judicial action to cancel the lease.

Changes in lease stipulations would not apply to locations with producing wells because the constraints applied through lease stipulations apply to exploration and development, not operations after the well is producing. However, any new wells to be developed on a lease with modified stipulations would be required to comply with the modified stipulations. Lease Notice CO-56 would apply to new development under Alternative 3. This lease notice states that air quality analysis may be required, including preparation of a comprehensive emissions inventory, air quality modeling, and interagency consultation with affected land managers and air quality regulators to determine potential mitigation options for any predicted significant impacts from proposed development. Compliance with the National Ambient Air Quality Standards and protection of nearby Class I or Sensitive Class II areas would be required.

In the WRNF Final EIS, Alternative C (Scenario 1) presented many new stipulations to protect surface resources that were not considered in the 1993 EIS. For example, there are stipulations to protect such resources as sensitive plant and animal species, migration corridors, scenic integrity, and paleontological resources, none of which are protections provided by the current stipulations. There are many more acres of lease stipulations and very little area with standard lease terms. The stipulations would be applied to the 65 previously issued leases under this alternative. For leases with producing wells, the new stipulations would only apply to new development. Existing wells would remain in production.

Table 2-3 lists the proposed stipulations for each lease. Note that the total acreage of stipulations on each lease may be greater than the total lease acreage because many stipulations overlap. **Figures 2-9** through **2-12** display the types of stipulations proposed for each lease.

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
1	058677	543	NSO	Bighorn Sheep Migration Corridors and Water Sources	362
				High Scenic Integrity Objective	541
				Research Natural Areas	540
				Roadless Areas	22
				Severe or High Landscape Stability Hazards	9
				Slope Greater than 50%	11
				Threatened, Endangered, Proposed, and Candidate (TEPC) Aquatic Species	6
				TEPC Plant Species	543
				Water Influence Zones	79

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
			CSU	Big Game Winter Ranges	543
				Highly Erodible Soils	123
				Paleontological Resources	543
				Plant Species of Local Concern	543
				Sensitive Aquatic Species	16
				Sensitive Plant Species	538
				Sensitive Terrestrial Avian Invertebrate Species	543
				Slopes 30 to 50%	97
			TL	Big Game Winter Range	534
1	059630	587	NSO	Bighorn Sheep Migration Corridors and Water Sources	289
				High Scenic Integrity Objective	574
				Research Natural Areas	572
				Roadless Areas	290
				Severe or High Landscape Stability Hazards	116
				Slope Greater than 50%	109
				TEPC Plant Species	585
				TEPC Wildlife Species	44
				Water Influence Zones	97
			CSU	Authorized Sites and Facilities	45
				Big Game Summer Concentration	126
				Big Game Winter Ranges	587
				Highly Erodible Soils	126
				Paleontological Resources	577
				Plant Species of Local Concern	581
				Sensitive Aquatic Species	1
				Sensitive Plant Species	574
				Sensitive Terrestrial Avian Invertebrate Species	578
				Slopes 30 to 50%	200
			TL	Big Game Summer Concentration	126
				Big Game Winter Range	587
1	066727	640	NSO	Bighorn Sheep Migration Corridors and Water Sources	518
				Bighorn Sheep Winter Habitats	413
				High Scenic Integrity Objective	640
				Research Natural Areas	640
				Roadless Areas	640
				Severe or High Landscape Stability Hazards	343

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
				Slope Greater than 50%	313
				TEPC Plant Species	158
				TEPC Wildlife Species	194
				Water Influence Zones	57
			CSU	Big Game Summer Concentration	218
				Big Game Winter Ranges	39
				Highly Erodible Soils	41
				Paleontological Resources	640
				Plant Species of Local Concern	102
				Sensitive Aquatic Species	21
				Sensitive Plant Species	640
				Sensitive Terrestrial Avian Invertebrate Species	640
				Slopes 30 to 50%	201
				Spruce Fir Old Growth and Old Growth Recruitment Stands	26
			TL	Big Game Summer Concentration	218
				Big Game Winter Range	39
1	066728	1,276	NSO	Bighorn Sheep Migration Corridors and Water Sources	1,275
				Bighorn Sheep Winter Habitats	25
				High Scenic Integrity Objective	1,275
				Research Natural Areas	1,275
				Roadless Areas	835
				Severe or High Landscape Stability Hazards	333
				Slope Greater than 50%	318
				TEPC Plant Species	1,252
				TEPC Wildlife Species	110
				Water Influence Zones	237
			CSU	Big Game Winter Ranges	1,132
				Highly Erodible Soils	167
				Paleontological Resources	1,275
				Plant Species of Local Concern	1,144
				Sensitive Aquatic Species	205
				Sensitive Plant Species	1,275
				Sensitive Terrestrial Avian Invertebrate Species	1,275
				Slopes 30 to 50%	396
			TL	Big Game Winter Range	728

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
1	066729	654	NSO	Bighorn Sheep Migration Corridors and Water Sources	270
				Bighorn Sheep Winter Habitats	488
				High Scenic Integrity Objective	655
				Research Natural Areas	654
				Roadless Areas	492
				Severe or High Landscape Stability Hazards	272
				Slope Greater than 50%	245
				TEPC Plant Species	579
				TEPC Wildlife Species	65
				Water Influence Zones	91
			CSU	Big Game Winter Ranges	655
				Highly Erodible Soils	13
				Paleontological Resources	655
				Plant Species of Local Concern	416
				Sensitive Aquatic Species	99
				Sensitive Plant Species	654
				Sensitive Terrestrial Avian Invertebrate Species	655
				Slopes 30 to 50%	209
			TL	Big Game Winter Range	110
1	066730	1,279	NSO	Bighorn Sheep Migration Corridors and Water Sources	722
				Bighorn Sheep Winter Habitats	341
				High Scenic Integrity Objective	1,279
				Research Natural Areas	1,279
				Roadless Areas	1,228
				Severe or High Landscape Stability Hazards	395
				Slope Greater than 50%	383
				TEPC Plant Species	706
				TEPC Wildlife Species	442
				Water Influence Zones	207
			CSU	Big Game Winter Ranges	287
				Paleontological Resources	1,279
				Plant Species of Local Concern	609
				Sensitive Aquatic Species	308
				Sensitive Plant Species	1,279
				Sensitive Terrestrial Avian Invertebrate Species	1,279
				Slopes 30 to 50%	482

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
				Spruce Fir Old Growth and Old Growth Recruitment Stands	20
1	066731	651	NSO	Authorized Sites and Facilities	126
				Bighorn Sheep Migration Corridors and Water Sources	120
				Bighorn Sheep Winter Habitats	21
				High Scenic Integrity Objective	645
				Research Natural Areas	644
				Roadless Areas	646
				Severe or High Landscape Stability Hazards	75
				Slope Greater than 50%	79
				TEPC Plant Species	339
				TEPC Wildlife Species	139
				Water Influence Zones	108
			CSU	Authorized Sites and Facilities	361
				Big Game Summer Concentration	649
				Big Game Winter Ranges	514
				Highly Erodible Soils	180
				Moderately High Landscape Stability Hazards	13
				Paleontological Resources	646
				Plant Species of Local Concern	325
				Sensitive Aquatic Species	63
				Sensitive Plant Species	651
				Sensitive Terrestrial Avian Invertebrate Species	651
				Slopes 30 to 50%	266
				Spruce Fir Old Growth and Old Growth Recruitment Stands	3
			TL	Big Game Summer Concentration	649
				Big Game Winter Range	506
1	066732	1,437	NSO	Bighorn Sheep Migration Corridors and Water Sources	768
				Bighorn Sheep Winter Habitats	663
				High Scenic Integrity Objective	1,435
				Research Natural Areas	1,433
				Roadless Areas	1,267
				Severe or High Landscape Stability Hazards	335
				Slope Greater than 50%	325
				TEPC Plant Species	1,016
				TEPC Wildlife Species	248

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
				Water Influence Zones	274
			CSU	Big Game Migration Corridors	80
				Big Game Winter Ranges	1,025
				Highly Erodible Soils	154
				Moderately High Landscape Stability Hazards	22
				Paleontological Resources	1,435
				Plant Species of Local Concern	1,375
				Sensitive Aquatic Species	71
				Sensitive Plant Species	1,435
				Sensitive Terrestrial Avian Invertebrate Species	1,435
				Slopes 30 to 50%	457
				Spruce Fir Old Growth and Old Growth Recruitment Stands	23
			TL	Big Game Winter Range	594
1	066733	1,416	NSO	Bighorn Sheep Migration Corridors and Water Sources	688
				Bighorn Sheep Winter Habitats	309
				High Scenic Integrity Objective	1,415
				Raptor Species Breeding Territories	703
				Research Natural Areas	1,377
				Roadless Areas	783
				Severe or High Landscape Stability Hazards	120
				Slope Greater than 50%	120
				TEPC Aquatic Species	713
				TEPC Plant Species	1,200
				TEPC Wildlife Species	106
				Water Influence Zones	285
				Public Water Supply Source Area Protection	790
			CSU	Big Game Winter Ranges	1,254
				Highly Erodible Soils	666
				Moderately High Landscape Stability Hazards	13
				Paleontological Resources	1,415
				Plant Species of Local Concern	1,418
				Sensitive Plant Species	1,418
				Sensitive Terrestrial Avian Invertebrate Species	1,400
				Slopes 30 to 50%	281
			TL	Big Game Winter Range	1,166

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
1	066926	1,629	NSO	Bighorn Sheep Migration Corridors and Water Sources	332
				Bighorn Sheep Production	935
				Bighorn Sheep Summer Concentration	404
				Bighorn Sheep Winter Habitats	1,381
				High Scenic Integrity Objective	1,159
				Raptor Species Breeding Territories	1,399
				Research Natural Areas	1,156
				Roadless Areas	1,082
				Severe or High Landscape Stability Hazards	377
				Slope Greater than 50%	313
				TEPC Aquatic Species	1,399
				TEPC Plant Species	1,044
				TEPC Wildlife Species	159
				Water Influence Zones	161
				NSO-Public Water Supply Source Area Protection	10
			CSU	Big Game Migration Corridors	36
				Big Game Winter Ranges	793
				Highly Erodible Soils	342
				Moderately High Landscape Stability Hazards	11
				Paleontological Resources	1,161
				Plant Species of Local Concern	1,629
				Sensitive Plant Species	1,629
				Sensitive Terrestrial Avian Invertebrate Species	1,629
				Slopes 30 to 50%	351
			TL	Big Game Winter Range	773
2	061121	964	NSO	Public Water Supply Source Area Protection	416
				Roadless Areas	667
				Severe or High Landscape Stability Hazards	19
				Slope Greater than 50%	20
				TEPC Plant Species	48
				TEPC Wildlife Species	57
				Water Influence Zones	112
			CSU	Big Game Migration Corridors	69
				Big Game Production Areas	184
				Big Game Summer Concentration	441
				Big Game Winter Ranges	964
				Ground Water Resources	8

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
				Highly Erodible Soils	805
				Moderately High Landscape Stability Hazards	11
				Paleontological Resources	963
				Plant Species of Local Concern	189
				Sensitive Aquatic Species	77
				Sensitive Plant Species	961
				Sensitive Terrestrial Avian Invertebrate Species	769
				Slopes 30 to 50%	302
			TL	Big Game Summer Concentration	441
				Big Game Winter Range	695
2	066723	1,280	NSO	Authorized Sites and Facilities	829
				Raptor Species Breeding Territories	120
				Roadless Areas	71
				Severe or High Landscape Stability Hazards	36
				Slope Greater than 50%	40
				TEPC Aquatic Species	1,077
				Water Influence Zones	174
			CSU	Authorized Sites and Facilities	1,165
				Big Game Migration Corridors	92
				Big Game Summer Concentration	1,280
				Big Game Winter Ranges	1,280
				Highly Erodible Soils	1,045
				Moderately High Landscape Stability Hazards	2
				Paleontological Resources	1,280
				Sensitive Aquatic Species	122
				Sensitive Plant Species	1,280
				Sensitive Terrestrial Avian Invertebrate Species	1,031
				Slopes 30 to 50%	422
			TL	Big Game Summer Concentration	1,280
				Big Game Winter Range	1,280
				Raptor Species Breeding Territories	120
2	066724	1,973	NSO	Authorized Sites and Facilities	866
				Raptor Species Breeding Territories	601
				Roadless Areas	1,221
				Severe or High Landscape Stability Hazards	7
				Slope Greater than 50%	29
				TEPC Aquatic Species	724
				Water Influence Zones	240

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
			CSU	Authorized Sites and Facilities	1,215
				Big Game Migration Corridors	164
				Big Game Production Areas	768
				Big Game Summer Concentration	1,973
				Big Game Winter Ranges	1,900
				Highly Erodible Soils	1,446
				Paleontological Resources	1,973
				Sensitive Aquatic Species	258
				Sensitive Plant Species	1,973
				Sensitive Terrestrial Avian Invertebrate Species	1,143
				Slopes 30 to 50%	524
			TL	Big Game Summer Concentration	1,973
				Big Game Winter Range	1,871
				Raptor Species Breeding Territories	274
2	066915	2,537	NSO	Authorized Sites and Facilities	336
				Native Cutthroat Trout Habitat	41
				Raptor Species Breeding Territories	1,529
				Roadless Areas	1,916
				Severe or High Landscape Stability Hazards	86
				Slope Greater than 50%	176
				TEPC Raptor Species	503
				TEPC Wildlife Species	334
				Water Influence Zones	279
			CSU	Authorized Sites and Facilities	998
				Big Game Migration Corridors	165
				Big Game Production Areas	1,845
				Big Game Summer Concentration	2,537
				Big Game Winter Ranges	2,456
				High Concern Travel Ways or Use Areas	662
				Highly Erodible Soils	2,082
				Moderately High Landscape Stability Hazards	8
				Paleontological Resources	2,537
				Sensitive Aquatic Species	465
				Sensitive Plant Species	2,537
				Sensitive Terrestrial Avian Invertebrate Species	2,169
				Slopes 30 to 50%	1,349

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
			TL	Big Game Summer Concentration	2,537
				Big Game Winter Range	2,325
				Raptor Species Breeding Territories	554
2	066916	2,562	NSO	Native Cutthroat Trout Habitat	10
				Raptor Species Breeding Territories	292
				Roadless Areas	2,562
				Severe or High Landscape Stability Hazards	115
				Slope Greater than 50%	135
				TEPC Wildlife Species	549
				Water Influence Zones	189
			CSU	Authorized Sites and Facilities	49
				Big Game Migration Corridors	175
				Big Game Production Areas	1,839
				Big Game Summer Concentration	2,376
				Big Game Winter Ranges	244
				High Concern Travel Ways or Use Areas	421
				Highly Erodible Soils	2,193
				Moderately High Landscape Stability Hazards	24
				Paleontological Resources	2,562
				Sensitive Aquatic Species	276
				Sensitive Plant Species	2,486
				Sensitive Terrestrial Avian Invertebrate Species	2,048
				Slopes 30 to 50%	943
			TL	Big Game Summer Concentration	2,376
				Big Game Winter Range	136
				Raptor Species Breeding Territories	135
2	066917	1,920	NSO	Authorized Sites and Facilities	68
				Fen Wetlands	0
				High Geologic Hazard—GMUGNF	20
				Native Cutthroat Trout Habitat	8
				Roadless Areas	1,324
				Severe or High Landscape Stability Hazards	4
				Slope Greater than 50%	13
				TEPC Aquatic Species	563
				TEPC Plant Species	349
				TEPC Wildlife Species	139
				Water Influence Zones	109

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
			CSU	Authorized Sites and Facilities	270
				Big Game Production Areas	70
				Big Game Summer Concentration	924
				Big Game Winter Ranges	99
				Elk Production Area—GMUGNF	439
				High Concern Travel Ways or Use Areas	1,201
				Highly Erodible Soils	1,337
				Paleontological Resources	1,452
				Plant Species of Local Concern	915
				Sensitive Aquatic Species	534
				Sensitive Plant Species	1,708
				Sensitive Terrestrial Avian Invertebrate Species	920
				Slopes 30 to 50%	277
				Watersheds with CRCT and GBCT Conservation Populations	206
			TL	Big Game Summer Concentration	924
2	066918	2,557	NSO	Severe or High Landscape Stability Hazards	472
				Slope Greater than 50%	367
				TEPC Aquatic Species	236
				TEPC Plant Species	44
				TEPC Wildlife Species	14
				Water Influence Zones	233
			CSU	Authorized Sites and Facilities	120
				Big Game Migration Corridors	11
				Big Game Summer Concentration	2,123
				Big Game Winter Ranges	2,557
				High Concern Travel Ways or Use Areas	476
				Highly Erodible Soils	2,286
				Moderately High Landscape Stability Hazards	27
				Paleontological Resources	2,553
				Sensitive Aquatic Species	0
				Sensitive Plant Species	2,557
				Sensitive Terrestrial Avian Invertebrate Species	2,493
				Slopes 30 to 50%	1,242
			TL	Big Game Summer Concentration	2,123
				Big Game Winter Range	2,557

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
2	066920	418	NSO	Authorized Sites and Facilities	165
				Native Cutthroat Trout Habitat	51
				Severe or High Landscape Stability Hazards	35
				Slope Greater than 50%	50
				TEPC Aquatic Species	7
				TEPC Wildlife Species	29
				Water Influence Zones	44
				NSO-Public Water Supply Source Area Protection	275
			CSU	Authorized Sites and Facilities	304
				Big Game Summer Concentration	51
				Big Game Winter Ranges	406
				High Concern Travel Ways or Use Areas	418
				Highly Erodible Soils	206
				Moderate Scenic Integrity Objective	185
				Moderately High Landscape Stability Hazards	68
				Paleontological Resources	418
				Sensitive Aquatic Species	63
				Sensitive Plant Species	301
				Sensitive Terrestrial Avian Invertebrate Species	123
				Slopes 30 to 50%	233
				Spruce Fir Old Growth and Old Growth Recruitment Stands	11
				Watersheds with CRCT and GBCT Conservation Populations	418
			TL	Big Game Summer Concentration	51
2	067147	783	NSO	Authorized Sites and Facilities	26
				Raptor Species Breeding Territories	11
				Roadless Areas	779
				Severe or High Landscape Stability Hazards	39
				Slope Greater than 50%	36
				TEPC Wildlife Species	72
				Water Influence Zones	107
			CSU	Authorized Sites and Facilities	119
				Big Game Production Areas	628
				Big Game Summer Concentration	662
				Big Game Winter Ranges	780
				High Concern Travel Ways or Use Areas	497
				Highly Erodible Soils	573

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
				Moderate Scenic Integrity Objective	372
				Moderately High Landscape Stability Hazards	25
				Paleontological Resources	779
				Sensitive Aquatic Species	210
				Sensitive Plant Species	779
				Sensitive Terrestrial Avian Invertebrate Species	614
				Slopes 30 to 50%	211
			TL	Big Game Summer Concentration	662
				Big Game Winter Range	462
2	067150	662	NSO	Raptor Species Breeding Territories	63
				Roadless Areas	634
				Severe or High Landscape Stability Hazards	86
				Slope Greater than 50%	83
				TEPC Wildlife Species	278
				Water Influence Zones	63
			CSU	Big Game Production Areas	625
				Big Game Summer Concentration	307
				Big Game Winter Ranges	647
				High Concern Travel Ways or Use Areas	2
				Highly Erodible Soils	546
				Moderate Scenic Integrity Objective	52
				Moderately High Landscape Stability Hazards	19
				Paleontological Resources	662
				Sensitive Plant Species	613
				Sensitive Terrestrial Avian Invertebrate Species	310
				Slopes 30 to 50%	248
				Spruce Fir Old Growth and Old Growth Recruitment Stands	27
			TL	Big Game Summer Concentration	307
				Raptor Species Breeding Territories	63
2	067542	480	NSO	Severe or High Landscape Stability Hazards	375
				Slope Greater than 50%	330
				TEPC Wildlife Species	297
				Water Influence Zones	44
			CSU	Big Game Migration Corridors	67
				Big Game Production Areas	145
				Big Game Summer Concentration	343
				Big Game Winter Ranges	467

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
				High Concern Travel Ways or Use Areas	53
				Highly Erodible Soils	45
				Moderately High Landscape Stability Hazards	0
				Paleontological Resources	480
				Sensitive Plant Species	479
				Sensitive Terrestrial Avian Invertebrate Species	306
				Slopes 30 to 50%	101
				Spruce Fir Old Growth and Old Growth Recruitment Stands	57
				Watersheds with CRCT and GBCT Conservation Populations	480
			TL	Big Game Summer Concentration	343
				Big Game Winter Range	14
				Raptor Species Breeding Territories	43
2	067543	1,167	NSO	Authorized Sites and Facilities	126
				Raptor Species Breeding Territories	57
				Roadless Areas	994
				Severe or High Landscape Stability Hazards	13
				Slope Greater than 50%	11
				Summer Non-Motorized Recreation	60
				TEPC Aquatic Species	128
				TEPC Wildlife Species	1,024
				Water Influence Zones	112
			CSU	Authorized Sites and Facilities	560
				Big Game Production Areas	268
				Big Game Summer Concentration	1,167
				Big Game Winter Ranges	579
				Ground Water Resources	479
				High Concern Travel Ways or Use Areas	995
				Highly Erodible Soils	834
				Moderate Scenic Integrity Objective	778
				Moderately High Landscape Stability Hazards	37
				Paleontological Resources	1,166
				Sensitive Aquatic Species	199
				Sensitive Plant Species	1,088
				Sensitive Terrestrial Avian Invertebrate Species	1,143
				Slopes 30 to 50%	202
				Spruce Fir Old Growth and Old Growth Recruitment Stands	405

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
				Watersheds with CRCT and GBCT Conservation Populations	451
			TL	Big Game Summer Concentration	1,167
2	067544	730	NSO	Native Cutthroat Trout Habitat	46
				Roadless Areas	241
				Severe or High Landscape Stability Hazards	15
				Slope Greater than 50%	20
				TEPC Wildlife Species	35
				Water Influence Zones	108
			CSU	Big Game Migration Corridors	92
				Big Game Production Areas	586
				Big Game Summer Concentration	730
				Big Game Winter Ranges	710
				Ground Water Resources	2
				High Concern Travel Ways or Use Areas	15
				Highly Erodible Soils	580
				Moderate Scenic Integrity Objective	59
				Moderately High Landscape Stability Hazards	80
				Paleontological Resources	729
				Sensitive Aquatic Species	93
				Sensitive Plant Species	667
				Sensitive Terrestrial Avian Invertebrate Species	395
				Slopes 30 to 50%	229
				Watersheds with CRCT and GBCT Conservation Populations	170
			TL	Big Game Summer Concentration	730
				Big Game Winter Range	19
2	070013	1,262	NSO	>60% Slope—GMUGNF	1
				Fen Wetlands	22
				High Geologic Hazard—GMUGNF	52
				Riparian/ Wetland—GMUGNF	3
				Roadless Area—GMUGNF	186
				Roadless Areas	1,200
				Severe or High Landscape Stability Hazards	41
				Slope Greater than 50%	46
				TEPC Aquatic Species	212
				TEPC Wildlife Species	9
				Water Influence Zones	88

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
			CSU	40-60% Slope—GMUGNF	33
				Big Game Summer Concentration	942
				Big Game Winter Ranges	1,199
				Ground Water Resources	65
				Highly Erodible Soils	1,034
				Moderate Geologic Hazard—GMUGNF	173
				Moderate Scenic Integrity Objective	0
				Paleontological Resources	1,036
				Sensitive Aquatic Species	212
				Sensitive Plant Species	1,255
				Sensitive Terrestrial Avian Invertebrate Species	478
				Slopes 30 to 50%	291
			TL	Big Game Summer Concentration	942
				Big Game Winter Range	796
2	070014	1,486	NSO	Authorized Sites and Facilities	251
				Fen Wetlands	38
				Native Cutthroat Trout Habitat	107
				Roadless Areas	1,485
				Severe or High Landscape Stability Hazards	24
				Slope Greater than 50%	49
				Summer Non-Motorized Recreation	781
				TEPC Aquatic Species	114
				TEPC Wildlife Species	1,163
				Water Influence Zones	168
			CSU	Authorized Sites and Facilities	722
				Big Game Production Areas	389
				Big Game Summer Concentration	1,486
				Big Game Winter Ranges	704
				Ground Water Resources	346
				Highly Erodible Soils	458
				Moderate Scenic Integrity Objective	1,187
				Moderately High Landscape Stability Hazards	155
				Paleontological Resources	1,486
				Sensitive Aquatic Species	219
				Sensitive Plant Species	1,394
				Sensitive Terrestrial Avian Invertebrate Species	1,277
				Slopes 30 to 50%	450

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
				Spruce Fir Old Growth and Old Growth Recruitment Stands	933
				Watersheds with CRCT and GBCT Conservation Populations	228
			TL	Big Game Summer Concentration	1,486
2	070015	1,598	NSO	Authorized Sites and Facilities	118
				Native Cutthroat Trout Habitat	39
				Roadless Areas	1,595
				Severe or High Landscape Stability Hazards	317
				Slope Greater than 50%	324
				Summer Non-Motorized Recreation	31
				TEPC Aquatic Species	45
				TEPC Wildlife Species	824
				Water Influence Zones	136
			CSU	Authorized Sites and Facilities	445
				Big Game Production Areas	683
				Big Game Summer Concentration	1,598
				Big Game Winter Ranges	1,564
				Ground Water Resources	298
				Highly Erodible Soils	700
				Moderate Scenic Integrity Objective	1,004
				Moderately High Landscape Stability Hazards	115
				Paleontological Resources	1,598
				Sensitive Aquatic Species	81
				Sensitive Plant Species	1,231
				Sensitive Terrestrial Avian Invertebrate Species	1,124
				Slopes 30 to 50%	671
				Spruce Fir Old Growth and Old Growth Recruitment Stands	420
				Watersheds with CRCT and GBCT Conservation Populations	693
			TL	Big Game Summer Concentration	1,598
2	070016	51	NSO	Roadless Areas	51
				TEPC Wildlife Species	40
				Water Influence Zones	6
			CSU	Big Game Production Areas	46
				Big Game Summer Concentration	51
				Big Game Winter Ranges	50
				Ground Water Resources	21

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
				High Concern Travel Ways or Use Areas	40
				Highly Erodible Soils	28
				Moderate Scenic Integrity Objective	50
				Moderately High Landscape Stability Hazards	0
				Paleontological Resources	51
				Sensitive Plant Species	1
				Sensitive Terrestrial Avian Invertebrate Species	44
				Slopes 30 to 50%	6
			TL	Big Game Summer Concentration	51
2	070361	638	NSO	Severe or High Landscape Stability Hazards	23
				Slope Greater than 50%	28
				TEPC Aquatic Species	288
				Water Influence Zones	27
			CSU	Big Game Summer Concentration	33
				Big Game Winter Ranges	638
				High Concern Travel Ways or Use Areas	517
				Highly Erodible Soils	590
				Moderate Geologic Hazard—GMUGNF	47
				Paleontological Resources	591
				Sensitive Aquatic Species	33
				Sensitive Plant Species	638
				Sensitive Terrestrial Avian Invertebrate Species	483
				Slopes 30 to 50%	231
			TL	Big Game Summer Concentration	33
				Big Game Winter Range	638
				Big Game Winter Range—GMUGNF	47
2	072157	638	NSO	Slope Greater than 50%	0
				TEPC Aquatic Species	419
				TEPC Wildlife Species	2
				Water Influence Zones	23
			CSU	Big Game Summer Concentration	4
				Big Game Winter Ranges	638
				High Concern Travel Ways or Use Areas	627
				Highly Erodible Soils	295
				Moderate Geologic Hazard—GMUGNF	341
				Paleontological Resources	298
				Sensitive Aquatic Species	4
				Sensitive Plant Species	498

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
				Sensitive Terrestrial Avian Invertebrate Species	249
				Slopes 30 to 50%	75
			TL	Big Game Summer Concentration	4
				Big Game Winter Range	638
				Big Game Winter Range—GMUGNF	341
2	075070	1,152	NSO	Authorized Sites and Facilities	40
				Raptor Species Breeding Territories	15
				Roadless Areas	1,113
				Severe or High Landscape Stability Hazards	92
				Slope Greater than 50%	95
				TEPC Wildlife Species	1
				Water Influence Zones	49
				Public Water Supply Source Area Protection	30
			CSU	Authorized Sites and Facilities	163
				Big Game Migration Corridors	116
				Big Game Production Areas	425
				Big Game Summer Concentration	31
				Big Game Winter Ranges	1,150
				High Concern Travel Ways or Use Areas	114
				Highly Erodible Soils	766
				Moderate Scenic Integrity Objective	3
				Moderately High Landscape Stability Hazards	59
				Paleontological Resources	1,151
				Plant Species of Local Concern	24
				Sensitive Aquatic Species	3
				Sensitive Plant Species	1,094
				Sensitive Terrestrial Avian Invertebrate Species	314
				Slopes 30 to 50%	452
				Watersheds with CRCT and GBCT Conservation Populations	267
			TL	Big Game Summer Concentration	31
				Big Game Winter Range	194
				Raptor Species Breeding Territories	15
2	076123	80	NSO	Raptor Species Breeding Territories	1
				Roadless Areas	80
				Severe or High Landscape Stability Hazards	2
				Slope Greater than 50%	2
				Water Influence Zones	13

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
			CSU	Authorized Sites and Facilities	28
				Big Game Production Areas	80
				Big Game Winter Ranges	80
				High Concern Travel Ways or Use Areas	79
				Highly Erodible Soils	31
				Moderate Scenic Integrity Objective	15
				Paleontological Resources	80
				Sensitive Plant Species	80
				Sensitive Terrestrial Avian Invertebrate Species	31
				Slopes 30 to 50%	29
			TL	Raptor Species Breeding Territories	1
3	058835	1,475	NSO	Roadless Areas	1,434
				Slope Greater than 50%	4
				TEPC Aquatic Species	6
				TEPC Wildlife Species	65
				Water Influence Zones	203
			CSU	Authorized Sites and Facilities	5
				Big Game Production Areas	1,239
				Big Game Summer Concentration	1,383
				Big Game Winter Ranges	1,471
				High Concern Travel Ways or Use Areas	549
				Highly Erodible Soils	1,179
				Paleontological Resources	1,474
				Sensitive Aquatic Species	189
				Sensitive Plant Species	1,432
				Sensitive Terrestrial Avian Invertebrate Species	829
				Slopes 30 to 50%	186
				Watersheds with CRCT and GBCT Conservation Populations	1,474
			TL	Big Game Summer Concentration	1,383
3	058836	1,279	NSO	Roadless Areas	1,222
				Slope Greater than 50%	1
				TEPC Aquatic Species	329
				TEPC Wildlife Species	12
				Water Influence Zones	201
			CSU	Big Game Production Areas	1,026
				Big Game Summer Concentration	1,181
				Big Game Winter Ranges	1,279

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
				High Concern Travel Ways or Use Areas	412
				Highly Erodible Soils	977
				Paleontological Resources	1,279
				Sensitive Aquatic Species	513
				Sensitive Plant Species	1,239
				Sensitive Terrestrial Avian Invertebrate Species	1,135
				Slopes 30 to 50%	39
				Watersheds with CRCT and GBCT Conservation Populations	1,279
			TL	Big Game Summer Concentration	1,181
3	058837	1,669	NSO	Authorized Sites and Facilities	126
				Fen Wetlands	12
				Native Cutthroat Trout Habitat	229
				Raptor Species Breeding Territories	476
				Roadless Areas	216
				Severe or High Landscape Stability Hazards	14
				Slope Greater than 50%	16
				TEPC Aquatic Species	221
				TEPC Wildlife Species	411
				Water Influence Zones	438
			CSU	Authorized Sites and Facilities	537
				Big Game Production Areas	232
				Big Game Summer Concentration	1,319
				Big Game Winter Ranges	1,402
				High Concern Travel Ways or Use Areas	1,583
				Highly Erodible Soils	713
				Paleontological Resources	1,669
				Sensitive Aquatic Species	812
				Sensitive Plant Species	1,646
				Sensitive Terrestrial Avian Invertebrate Species	1,501
				Slopes 30 to 50%	77
				Watersheds with CRCT and GBCT Conservation Populations	1,669
			TL	Big Game Summer Concentration	1,319
				Big Game Winter Range	10
				Raptor Species Breeding Territories	476

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
3	058838	1,277	NSO	Authorized Sites and Facilities	110
				Roadless Areas	693
				Slope Greater than 50%	12
				TEPC Aquatic Species	226
				TEPC Wildlife Species	105
				Water Influence Zones	196
			CSU	Areas of Moderate Geologic Hazard—GMUGNF	26
				Authorized Sites and Facilities	352
				Big Game Production Areas	304
				Big Game Summer Concentration	1,221
				Big Game Winter Ranges	1,252
				High Concern Travel Ways or Use Areas	28
				Highly Erodible Soils	962
				Moderately High Landscape Stability Hazards	5
				Paleontological Resources	1,252
				Sensitive Aquatic Species	328
				Sensitive Plant Species	649
				Sensitive Terrestrial Avian Invertebrate Species	1,043
				Slopes 30 to 50%	199
				Watersheds with CRCT and GBCT Conservation Populations	1,253
			TL	Big Game Summer Concentration	1,221
3	058839	1,127	NSO	Authorized Sites and Facilities	420
				Fen Wetlands	2
				Native Cutthroat Trout Habitat	183
				Roadless Areas	650
				Slope Greater than 50%	7
				TEPC Wildlife Species	268
				Water Influence Zones	222
			CSU	Authorized Sites and Facilities	908
				Big Game Production Areas	528
				Big Game Summer Concentration	1,127
				Big Game Winter Ranges	1,017
				High Concern Travel Ways or Use Areas	1,035
				Highly Erodible Soils	870
				Paleontological Resources	1,127
				Sensitive Aquatic Species	490
				Sensitive Plant Species	1,115

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
				Sensitive Terrestrial Avian Invertebrate Species	897
				Slopes 30 to 50%	125
				Spruce Fir Old Growth and Old Growth Recruitment Stands	35
				Watersheds with CRCT and GBCT Conservation Populations	893
			TL	Big Game Summer Concentration	1,127
				Big Game Winter Range	184
3	058840	639	NSO	Native Cutthroat Trout Habitat	7
				Raptor Species Breeding Territories	27
				Roadless Areas	630
				TEPC Aquatic Species	75
				TEPC Wildlife Species	186
				Water Influence Zones	83
			CSU	Authorized Sites and Facilities	58
				Big Game Summer Concentration	213
				Big Game Winter Ranges	2
				High Concern Travel Ways or Use Areas	503
				Highly Erodible Soils	208
				Paleontological Resources	639
				Sensitive Aquatic Species	139
				Sensitive Plant Species	638
				Sensitive Terrestrial Avian Invertebrate Species	596
				Slopes 30 to 50%	15
				Watersheds with CRCT and GBCT Conservation Populations	639
			TL	Big Game Summer Concentration	213
				Raptor Species Breeding Territories	27
3	058841	638	NSO	Native Cutthroat Trout Habitat	110
				Raptor Species Breeding Territories	88
				Roadless Areas	134
				TEPC Aquatic Species	95
				TEPC Wildlife Species	125
				Water Influence Zones	124
			CSU	Big Game Summer Concentration	578
				Big Game Winter Ranges	454
				High Concern Travel Ways or Use Areas	638
				Highly Erodible Soils	340
				Paleontological Resources	638

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
				Sensitive Aquatic Species	156
				Sensitive Plant Species	252
				Sensitive Terrestrial Avian Invertebrate Species	608
				Slopes 30 to 50%	10
				Watersheds with CRCT and GBCT Conservation Populations	638
			TL	Big Game Summer Concentration	578
3	066687	1,053	NSO	Authorized Sites and Facilities	3
				Public Water Supply Source Area Protection	279
				Severe or High Landscape Stability Hazards	44
				Slope Greater than 50%	70
				TEPC Aquatic Species	55
				TEPC Wildlife Species	466
				Water Influence Zones	65
			CSU	Authorized Sites and Facilities	64
				Big Game Production Areas	733
				Big Game Winter Ranges	1,041
				Communication Sites	332
				High Concern Travel Ways or Use Areas	782
				Highly Erodible Soils	59
				Moderate Scenic Integrity Objective	128
				Moderately High Landscape Stability Hazards	7
				Paleontological Resources	1,050
				Sensitive Aquatic Species	89
				Sensitive Plant Species	676
				Sensitive Terrestrial Avian Invertebrate Species	257
				Slopes 30 to 50%	524
				Spruce Fir Old Growth and Old Growth Recruitment Stands	105
			TL	Big Game Winter Range	8
3	066688	774	NSO	Public Water Supply Source Area Protection	770
				Severe or High Landscape Stability Hazards	94
				Slope Greater than 50%	98
				TEPC Aquatic Species	90
				TEPC Wildlife Species	222
				Water Influence Zones	26
			CSU	Authorized Sites and Facilities	38
				Big Game Production Areas	160

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
				Big Game Winter Ranges	770
				High Concern Travel Ways or Use Areas	573
				Highly Erodible Soils	162
				Moderate Scenic Integrity Objective	44
				Moderately High Landscape Stability Hazards	19
				Paleontological Resources	774
				Sensitive Plant Species	493
				Sensitive Terrestrial Avian Invertebrate Species	172
				Slopes 30 to 50%	371
			TL	Bald Eagle Winter Roost and Perch Sites	3
				Big Game Summer Concentration	1
				Big Game Winter Range	174
3	066689	40	NSO	Public Water Supply Source Area Protection	40
				TEPC Wildlife Species	11
				Water Influence Zones	1
			CSU	Big Game Production Areas	40
				Big Game Winter Ranges	40
				High Concern Travel Ways or Use Areas	40
				Highly Erodible Soils	40
				Moderate Scenic Integrity Objective	9
				Paleontological Resources	40
				Slopes 30 to 50%	3
3	066690	274	NSO	Authorized Sites and Facilities	0
				Public Water Supply Source Area Protection	80
				Severe or High Landscape Stability Hazards	4
				Slope Greater than 50%	6
				TEPC Aquatic Species	7
				TEPC Wildlife Species	113
				Water Influence Zones	38
			CSU	Authorized Sites and Facilities	94
				Big Game Production Areas	203
				Big Game Winter Ranges	78
				High Concern Travel Ways or Use Areas	274
				Highly Erodible Soils	174
				Moderate Scenic Integrity Objective	172
				Paleontological Resources	274
				Sensitive Aquatic Species	40
				Sensitive Plant Species	20

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
				Sensitive Terrestrial Avian Invertebrate Species	116
				Slopes 30 to 50%	97
			TL	Big Game Winter Range	45
3	066691	198	NSO	Native Cutthroat Trout Habitat	41
				Roadless Areas	50
				Severe or High Landscape Stability Hazards	36
				Slope Greater than 50%	36
				TEPC Aquatic Species	3
				TEPC Wildlife Species	76
				Water Influence Zones	25
			CSU	Highly Erodible Soils	131
				Moderately High Landscape Stability Hazards	3
				Paleontological Resources	198
				Sensitive Aquatic Species	58
				Sensitive Plant Species	198
				Sensitive Terrestrial Avian Invertebrate Species	87
				Slopes 30 to 50%	95
				Watersheds with CRCT and GBCT Conservation Populations	198
3	066692	1,417	NSO	Fen Wetlands	31
				Raptor Species Breeding Territories	691
				Roadless Areas	1,331
				Severe or High Landscape Stability Hazards	7
				Slope Greater than 50%	19
				TEPC Aquatic Species	35
				TEPC Wildlife Species	737
				Water Influence Zones	187
			CSU	Big Game Summer Concentration	623
				Big Game Winter Ranges	3
				Ground Water Resources	110
				Highly Erodible Soils	1,193
				Moderately High Landscape Stability Hazards	14
				Paleontological Resources	1,417
				Sensitive Aquatic Species	64
				Sensitive Plant Species	534
				Sensitive Terrestrial Avian Invertebrate Species	596
				Slopes 30 to 50%	224

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
				Spruce Fir Old Growth and Old Growth Recruitment Stands	209
				Watersheds with CRCT and GBCT Conservation Populations	1,417
			TL	Big Game Summer Concentration	623
				Big Game Winter Range	3
				Raptor Species Breeding Territories	15
3	066693	2,167	NSO	Fen Wetlands	51
				Public Water Supply Source Area Protection	1,023
				Severe or High Landscape Stability Hazards	81
				Slope Greater than 50%	98
				TEPC Aquatic Species	128
				TEPC Wildlife Species	1,028
				Water Influence Zones	267
			CSU	Big Game Production Areas	1,070
				Big Game Winter Ranges	2,003
				Ground Water Resources	0
				High Concern Travel Ways or Use Areas	1,973
				Highly Erodible Soils	1,199
				Moderate Scenic Integrity Objective	43
				Paleontological Resources	2,163
				Sensitive Aquatic Species	321
				Sensitive Plant Species	854
				Sensitive Terrestrial Avian Invertebrate Species	503
				Slopes 30 to 50%	688
				Spruce Fir Old Growth and Old Growth Recruitment Stands	30
				Watersheds with CRCT and GBCT Conservation Populations	735
			TL	Bald Eagle Winter Roost and Perch Sites	0
				Big Game Winter Range	901
3	066694	119	NSO	Native Cutthroat Trout Habitat	5
				Roadless Areas	116
				Severe or High Landscape Stability Hazards	20
				Slope Greater than 50%	26
				TEPC Aquatic Species	0
				TEPC Wildlife Species	33
				Water Influence Zones	3

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
			CSU	Highly Erodible Soils	86
				Paleontological Resources	119
				Sensitive Aquatic Species	10
				Sensitive Plant Species	100
				Sensitive Terrestrial Avian Invertebrate Species	11
				Slopes 30 to 50%	81
				Watersheds with CRCT and GBCT Conservation Populations	119
3	066695	1,061	NSO	Fen Wetlands	21
				Roadless Areas	618
				Severe or High Landscape Stability Hazards	78
				Slope Greater than 50%	74
				TEPC Aquatic Species	5
				TEPC Wildlife Species	449
				Water Influence Zones	106
			CSU	Big Game Production Areas	175
				Big Game Summer Concentration	681
				Big Game Winter Ranges	913
				Highly Erodible Soils	486
				Moderate Scenic Integrity Objective	57
				Moderately High Landscape Stability Hazards	22
				Paleontological Resources	1,061
				Sensitive Aquatic Species	10
				Sensitive Plant Species	718
				Sensitive Terrestrial Avian Invertebrate Species	190
				Slopes 30 to 50%	414
				Spruce Fir Old Growth and Old Growth Recruitment Stands	271
				Watersheds with CRCT and GBCT Conservation Populations	1,061
			TL	Big Game Summer Concentration	681
				Big Game Winter Range	442
3	066696	1,027	NSO	Fen Wetlands	36
				Native Cutthroat Trout Habitat	139
				Raptor Species Breeding Territories	49
				Roadless Areas	910
				Severe or High Landscape Stability Hazards	33
				Slope Greater than 50%	47
				TEPC Aquatic Species	129

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
				TEPC Wildlife Species	446
				Water Influence Zones	131
			CSU	Big Game Production Areas	289
				Big Game Summer Concentration	893
				Big Game Winter Ranges	384
				Ground Water Resources	13
				Highly Erodible Soils	717
				Moderately High Landscape Stability Hazards	2
				Paleontological Resources	1,027
				Sensitive Aquatic Species	214
				Sensitive Plant Species	481
				Sensitive Terrestrial Avian Invertebrate Species	351
				Slopes 30 to 50%	522
				Spruce Fir Old Growth and Old Growth Recruitment Stands	248
				Watersheds with CRCT and GBCT Conservation Populations	1,027
			TL	Big Game Summer Concentration	893
				Big Game Winter Range	81
3	066697	1,872	NSO	Fen Wetlands	32
				Native Cutthroat Trout Habitat	105
				Roadless Areas	1,120
				Severe or High Landscape Stability Hazards	42
				Slope Greater than 50%	43
				TEPC Aquatic Species	116
				TEPC Wildlife Species	1,636
				Water Influence Zones	172
			CSU	Big Game Production Areas	1,028
				Big Game Summer Concentration	1,863
				Big Game Winter Ranges	1,512
				Ground Water Resources	442
				High Concern Travel Ways or Use Areas	965
				Highly Erodible Soils	742
				Paleontological Resources	1,872
				Sensitive Aquatic Species	181
				Sensitive Plant Species	1,619
				Sensitive Terrestrial Avian Invertebrate Species	1,442
				Slopes 30 to 50%	525

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
				Spruce Fir Old Growth and Old Growth Recruitment Stands	1,081
				Watersheds with CRCT and GBCT Conservation Populations	1,872
			TL	Big Game Summer Concentration	1,863
3	066698	2,460	NSO	Fen Wetlands	69
				Roadless Areas	1,893
				Slope Greater than 50%	4
				TEPC Aquatic Species	114
				TEPC Wildlife Species	2,247
				Water Influence Zones	212
			CSU	Big Game Production Areas	913
				Big Game Summer Concentration	2,460
				Big Game Winter Ranges	2,460
				Ground Water Resources	723
				High Concern Travel Ways or Use Areas	448
				Highly Erodible Soils	734
				Paleontological Resources	2,460
				Sensitive Aquatic Species	218
				Sensitive Plant Species	2,456
				Sensitive Terrestrial Avian Invertebrate Species	1,669
				Slopes 30 to 50%	282
				Spruce Fir Old Growth and Old Growth Recruitment Stands	1,312
				Watersheds with CRCT and GBCT Conservation Populations	2,460
			TL	Big Game Summer Concentration	2,460
3	066699	114	NSO	Roadless Areas	80
				TEPC Wildlife Species	111
				Water Influence Zones	13
			CSU	Big Game Summer Concentration	78
				Big Game Winter Ranges	111
				Highly Erodible Soils	42
				Paleontological Resources	114
				Sensitive Plant Species	114
				Slopes 30 to 50%	48
				Spruce Fir Old Growth and Old Growth Recruitment Stands	114
				Watersheds with CRCT and GBCT Conservation Populations	114

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
			TL	Big Game Summer Concentration	78
3	066700	841	NSO	Alpine	53
				Fen Wetlands	38
				Roadless Areas	833
				Severe or High Landscape Stability Hazards	73
				Slope Greater than 50%	78
				TEPC Wildlife Species	806
				Water Influence Zones	111
			CSU	Big Game Summer Concentration	682
				Big Game Winter Ranges	539
				Highly Erodible Soils	77
				Moderate Scenic Integrity Objective	615
				Moderately High Landscape Stability Hazards	21
				Paleontological Resources	827
				Sensitive Aquatic Species	0
				Sensitive Plant Species	841
				Sensitive Terrestrial Avian Invertebrate Species	133
				Slopes 30 to 50%	359
				Spruce Fir Old Growth and Old Growth Recruitment Stands	585
				Watersheds with CRCT and GBCT Conservation Populations	542
			TL	Big Game Summer Concentration	682
3	066701	1,885	NSO	Fen Wetlands	153
				Roadless Areas	1,815
				Severe or High Landscape Stability Hazards	43
				Slope Greater than 50%	48
				TEPC Aquatic Species	327
				TEPC Wildlife Species	1,309
				Water Influence Zones	372
			CSU	Big Game Production Areas	395
				Big Game Summer Concentration	1,885
				Big Game Winter Ranges	1,885
				Highly Erodible Soils	621
				Moderate Scenic Integrity Objective	181
				Paleontological Resources	1,885
				Sensitive Aquatic Species	481
				Sensitive Plant Species	1,709

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
				Sensitive Terrestrial Avian Invertebrate Species	488
				Slopes 30 to 50%	608
				Spruce Fir Old Growth and Old Growth Recruitment Stands	963
				Watersheds with CRCT and GBCT Conservation Populations	1,884
			TL	Big Game Summer Concentration	1,885
3	066702	1,254	NSO	Alpine	0
				Fen Wetlands	25
				Roadless Areas	570
				Severe or High Landscape Stability Hazards	131
				Slope Greater than 50%	129
				TEPC Aquatic Species	117
				TEPC Wildlife Species	738
				Water Influence Zones	198
			CSU	Big Game Summer Concentration	557
				Big Game Winter Ranges	415
				Highly Erodible Soils	490
				Moderate Scenic Integrity Objective	331
				Moderately High Landscape Stability Hazards	16
				Paleontological Resources	1,164
				Sensitive Aquatic Species	182
				Sensitive Plant Species	887
				Sensitive Terrestrial Avian Invertebrate Species	508
				Slopes 30 to 50%	381
				Spruce Fir Old Growth and Old Growth Recruitment Stands	282
				Watersheds with CRCT and GBCT Conservation Populations	421
			TL	Big Game Summer Concentration	557
3	066706	2,548	NSO	Fen Wetlands	3
				Raptor Species Breeding Territories	1,172
				Roadless Areas	1,932
				Severe or High Landscape Stability Hazards	27
				Slope Greater than 50%	27
				TEPC Aquatic Species	43
				TEPC Raptor Species	406
				TEPC Wildlife Species	1,514
				Water Influence Zones	246

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
			CSU	Authorized Sites and Facilities	81
				Big Game Production Areas	693
				Big Game Summer Concentration	273
				High Concern Travel Ways or Use Areas	1,226
				Highly Erodible Soils	1,633
				Moderate Scenic Integrity Objective	342
				Paleontological Resources	2,548
				Sensitive Aquatic Species	77
				Sensitive Plant Species	693
				Sensitive Terrestrial Avian Invertebrate Species	2,054
				Slopes 30 to 50%	172
				Spruce Fir Old Growth and Old Growth Recruitment Stands	6
				Watersheds with CRCT and GBCT Conservation Populations	994
			TL	Big Game Summer Concentration	273
				Raptor Species Breeding Territories	496
3	066707	1,276	NSO	Fen Wetlands	27
				Native Cutthroat Trout Habitat	4
				Raptor Species Breeding Territories	164
				Roadless Areas	1,168
				Severe or High Landscape Stability Hazards	31
				Slope Greater than 50%	31
				TEPC Aquatic Species	2
				TEPC Wildlife Species	1,030
				Water Influence Zones	94
			CSU	Big Game Summer Concentration	331
				High Concern Travel Ways or Use Areas	172
				Highly Erodible Soils	1,003
				Moderately High Landscape Stability Hazards	5
				Paleontological Resources	1,276
				Sensitive Aquatic Species	8
				Sensitive Plant Species	750
				Sensitive Terrestrial Avian Invertebrate Species	1,105
				Slopes 30 to 50%	199
				Spruce Fir Old Growth and Old Growth Recruitment Stands	87
				Watersheds with CRCT and GBCT Conservation Populations	1,231

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
			TL	Big Game Summer Concentration	331
				Raptor Species Breeding Territories	0
3	066708	2,554	NSO	Fen Wetlands	76
				Native Cutthroat Trout Habitat	184
				Raptor Species Breeding Territories	1,518
				Roadless Areas	1,339
				TEPC Aquatic Species	77
				TEPC Wildlife Species	1,693
				Water Influence Zones	277
			CSU	Big Game Production Areas	297
				Big Game Summer Concentration	898
				Big Game Winter Ranges	8
				High Concern Travel Ways or Use Areas	1,847
				Highly Erodible Soils	2,106
				Paleontological Resources	2,554
				Sensitive Aquatic Species	247
				Sensitive Plant Species	1,669
				Sensitive Terrestrial Avian Invertebrate Species	2,522
				Slopes 30 to 50%	291
				Spruce Fir Old Growth and Old Growth Recruitment Stands	29
				Watersheds with CRCT and GBCT Conservation Populations	2,554
			TL	Big Game Summer Concentration	898
				Raptor Species Breeding Territories	632
				Western Boreal Toad Breeding Sites	6
3	066709	638	NSO	Fen Wetlands	25
				Native Cutthroat Trout Habitat	0
				Raptor Species Breeding Territories	364
				Roadless Areas	170
				TEPC Wildlife Species	556
				Water Influence Zones	50
			CSU	Big Game Summer Concentration	467
				High Concern Travel Ways or Use Areas	508
				Highly Erodible Soils	440
				Paleontological Resources	638
				Sensitive Aquatic Species	1
				Sensitive Plant Species	199

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
				Sensitive Terrestrial Avian Invertebrate Species	558
				Slopes 30 to 50%	75
				Spruce Fir Old Growth and Old Growth Recruitment Stands	213
				Watersheds with CRCT and GBCT Conservation Populations	638
			TL	Big Game Summer Concentration	467
				Raptor Species Breeding Territories	137
				Western Boreal Toad Breeding Sites	94
3	066710	2,329	NSO	Authorized Sites and Facilities	303
				Raptor Species Breeding Territories	153
				Roadless Areas	1,896
				Slope Greater than 50%	2
				TEPC Aquatic Species	132
				TEPC Wildlife Species	529
				Water Influence Zones	351
			CSU	Authorized Sites and Facilities	572
				Big Game Production Areas	422
				Big Game Summer Concentration	722
				High Concern Travel Ways or Use Areas	826
				Highly Erodible Soils	1,546
				Moderate Scenic Integrity Objective	460
				Moderately High Landscape Stability Hazards	7
				Paleontological Resources	2,328
				Sensitive Aquatic Species	204
				Sensitive Plant Species	1,205
				Sensitive Terrestrial Avian Invertebrate Species	1,160
				Slopes 30 to 50%	392
				Watersheds with CRCT and GBCT Conservation Populations	895
			TL	Big Game Summer Concentration	722
3	066711	1,751	NSO	Fen Wetlands	48
				Native Cutthroat Trout Habitat	73
				Raptor Species Breeding Territories	560
				Roadless Areas	181
				TEPC Aquatic Species	80
				TEPC Raptor Species	97
				TEPC Wildlife Species	1,275
				Water Influence Zones	163

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
			CSU	Big Game Production Areas	632
				Big Game Winter Ranges	133
				High Concern Travel Ways or Use Areas	1,701
				Highly Erodible Soils	491
				Moderate Scenic Integrity Objective	55
				Paleontological Resources	1,751
				Sensitive Aquatic Species	198
				Sensitive Plant Species	1,323
				Sensitive Terrestrial Avian Invertebrate Species	815
				Slopes 30 to 50%	100
				Spruce Fir Old Growth and Old Growth Recruitment Stands	7
				Watersheds with CRCT and GBCT Conservation Populations	1,219
			TL	Raptor Species Breeding Territories	318
				Western Boreal Toad Breeding Sites	461
3	066712	875	NSO	Fen Wetlands	90
				Native Cutthroat Trout Habitat	36
				Roadless Areas	481
				Severe or High Landscape Stability Hazards	2
				Slope Greater than 50%	2
				TEPC Aquatic Species	37
				TEPC Wildlife Species	539
				Water Influence Zones	154
			CSU	Big Game Migration Corridors	79
				Big Game Production Areas	488
				Big Game Winter Ranges	343
				High Concern Travel Ways or Use Areas	345
				Highly Erodible Soils	617
				Paleontological Resources	875
				Sensitive Aquatic Species	80
				Sensitive Plant Species	211
				Sensitive Terrestrial Avian Invertebrate Species	465
				Slopes 30 to 50%	109
				Spruce Fir Old Growth and Old Growth Recruitment Stands	11
				Watersheds with CRCT and GBCT Conservation Populations	875
			TL	Western Boreal Toad Breeding Sites	550

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
3	066908	2,400	NSO	Authorized Sites and Facilities	98
				Fen Wetlands	55
				Public Water Supply Source Area Protection	73
				Roadless Areas	1,217
				Slope Greater than 50%	4
				TEPC Aquatic Species	411
				TEPC Wildlife Species	1,101
				Water Influence Zones	382
			CSU	Authorized Sites and Facilities	286
				Big Game Migration Corridors	270
				Big Game Production Areas	1,945
				Big Game Winter Ranges	2,333
				High Concern Travel Ways or Use Areas	975
				Highly Erodible Soils	2,010
				Paleontological Resources	2,400
				Sensitive Aquatic Species	671
				Sensitive Plant Species	1,343
				Sensitive Terrestrial Avian Invertebrate Species	731
				Slopes 30 to 50%	353
				Watersheds with CRCT and GBCT Conservation Populations	2,335
3	066909	2,077	NSO	Authorized Sites and Facilities	27
				Fen Wetlands	44
				Native Cutthroat Trout Habitat	64
				Raptor Species Breeding Territories	240
				Roadless Areas	826
				Severe or High Landscape Stability Hazards	113
				Slope Greater than 50%	127
				TEPC Aquatic Species	54
				TEPC Wildlife Species	864
				Water Influence Zones	203
			CSU	Authorized Sites and Facilities	181
				Big Game Migration Corridors	178
				Big Game Production Areas	543
				Big Game Winter Ranges	1,104
				Ground Water Resources	40
				High Concern Travel Ways or Use Areas	37
				Highly Erodible Soils	1,360

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
				Paleontological Resources	2,077
				Sensitive Aquatic Species	183
				Sensitive Plant Species	1,303
				Sensitive Terrestrial Avian Invertebrate Species	897
				Slopes 30 to 50%	837
				Spruce Fir Old Growth and Old Growth Recruitment Stands	45
				Watersheds with CRCT and GBCT Conservation Populations	2,067
			TL	Big Game Winter Range	263
3	066913	1,660	NSO	Raptor Species Breeding Territories	726
				Roadless Areas	507
				Severe or High Landscape Stability Hazards	1
				Slope Greater than 50%	0
				TEPC Aquatic Species	97
				TEPC Raptor Species	292
				TEPC Wildlife Species	688
				Water Influence Zones	177
			CSU	Authorized Sites and Facilities	6
				Big Game Production Areas	168
				Big Game Summer Concentration	1,427
				Big Game Winter Ranges	414
				High Concern Travel Ways or Use Areas	1,501
				Highly Erodible Soils	1,065
				Moderately High Landscape Stability Hazards	5
				Paleontological Resources	1,660
				Sensitive Aquatic Species	176
				Sensitive Plant Species	903
				Sensitive Terrestrial Avian Invertebrate Species	1,218
				Slopes 30 to 50%	212
				Spruce Fir Old Growth and Old Growth Recruitment Stands	54
				Watersheds with CRCT and GBCT Conservation Populations	1,660
			TL	Big Game Summer Concentration	1,427
				Raptor Species Breeding Territories	351
4	066948	2,562	NSO	Fen Wetlands	98
				Raptor Species Breeding Territories	2,085
				Severe or High Landscape Stability Hazards	18

Table 2-3 Lease Stipulations Under Alternative 3

Zone	Lease No.	Lease Acres	Type of Stipulation	Type of Restriction[1]	Acres of Stipulation
				Slope Greater than 50%	39
				TEPC Aquatic Species	48
				TEPC Raptor Species	503
				TEPC Wildlife Species	1,239
				Water Influence Zones	302
			CSU	Big Game Production Areas	1,709
				Big Game Summer Concentration	2
				Big Game Winter Ranges	469
				Ground Water Resources	89
				High Concern Travel Ways or Use Areas	1,421
				Highly Erodible Soils	1,176
				Moderate Scenic Integrity Objective	789
				Moderately High Landscape Stability Hazards	7
				Paleontological Resources	2,561
				Sensitive Aquatic Species	91
				Sensitive Plant Species	2,282
				Sensitive Terrestrial Avian Invertebrate Species	1,284
				Slopes 30 to 50%	156
				Spruce Fir Old Growth and Old Growth Recruitment Stands	132
				Watersheds with CRCT and GBCT Conservation Populations	2,562
			TL	Bald Eagle Winter Roost and Perch Sites	2,562
				Big Game Summer Concentration	2
				Big Game Winter Range	317
				Raptor Species Breeding Territories	587

[1] TEPC = Threatened, Endangered, Proposed, or Candidate.
CRCT = Colorado River cutthroat trout.
GBCT = greenback lineage cutthroat trout.
GMUGNF = Grand Mesa, Uncompahgre and Gunnison National Forests.

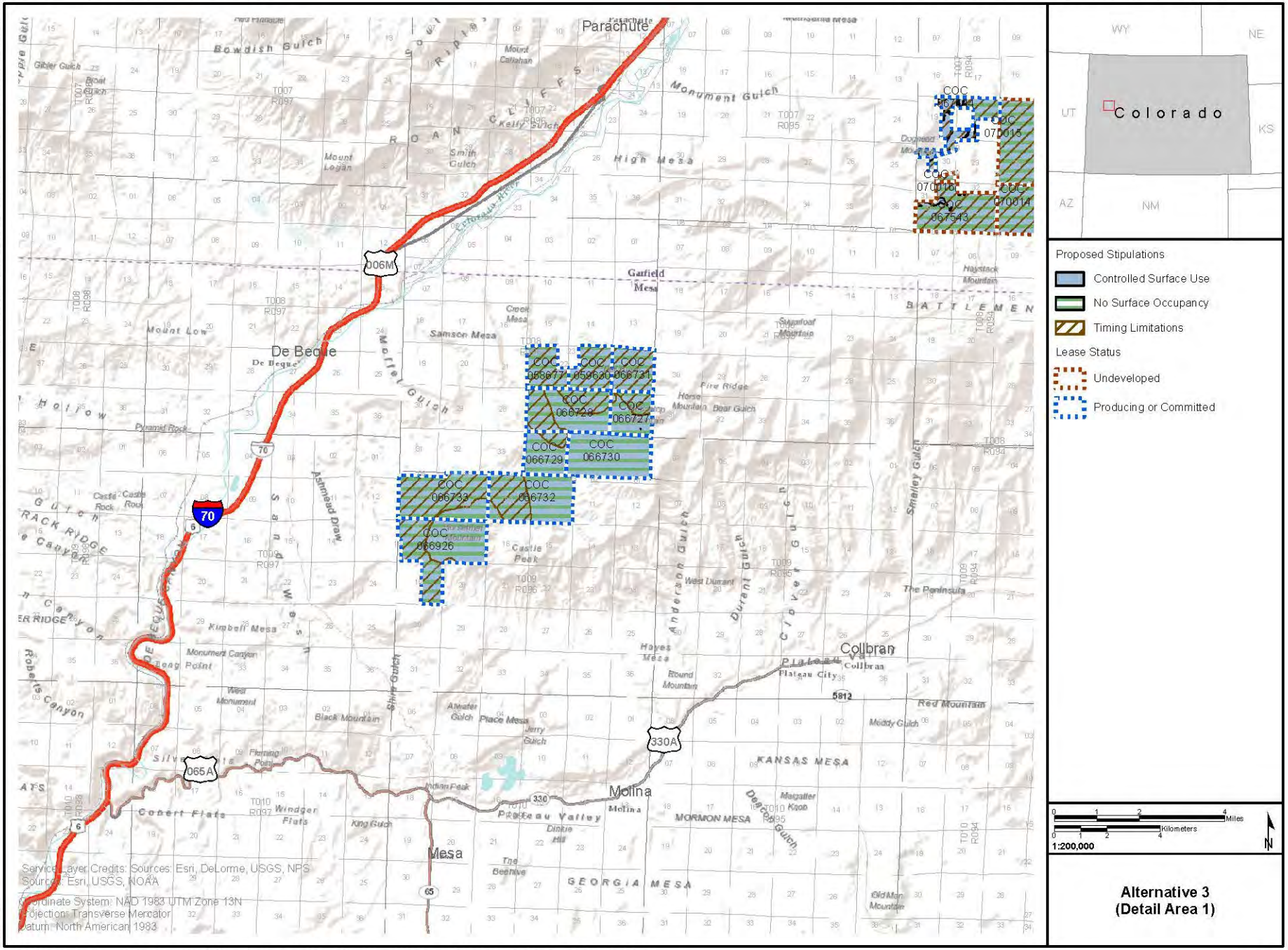

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Figure 2-9 Proposed Lease Stipulations under Alternative 3, West Side

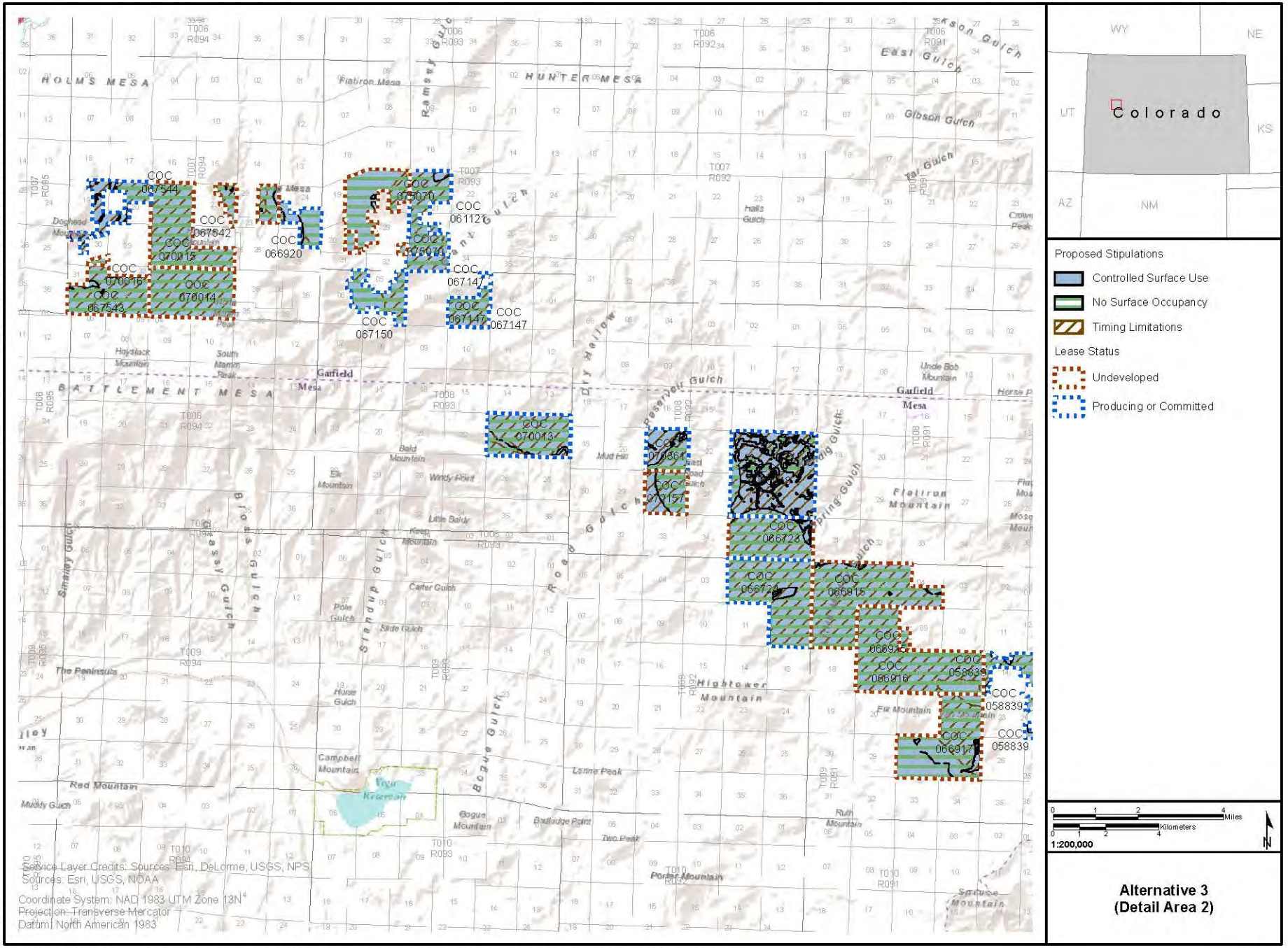

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Figure 2-10 Proposed Lease Stipulations under Alternative 3, Middle Section

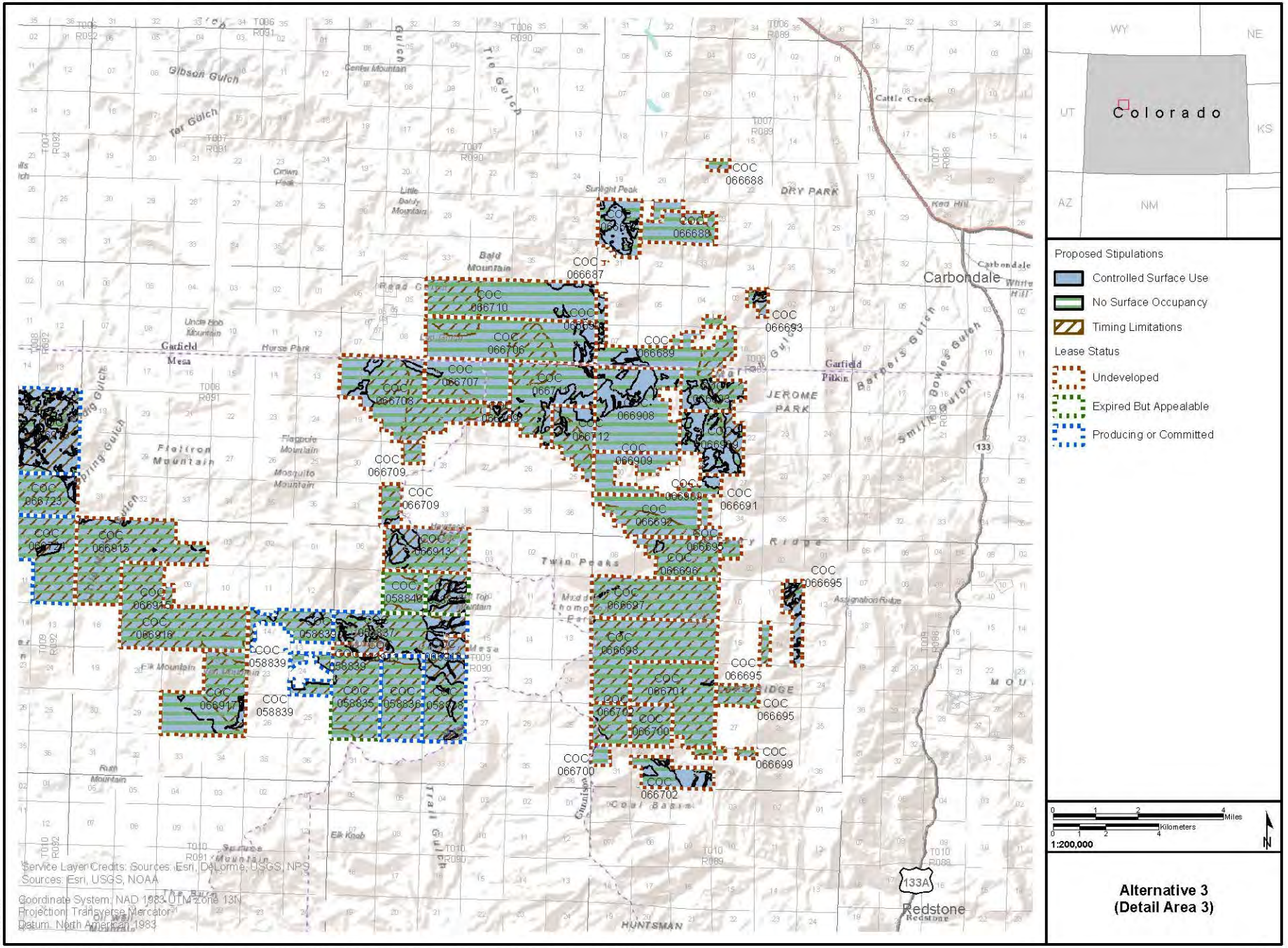

Figure 2-11 Proposed Lease Stipulations under Alternative 3, East Side

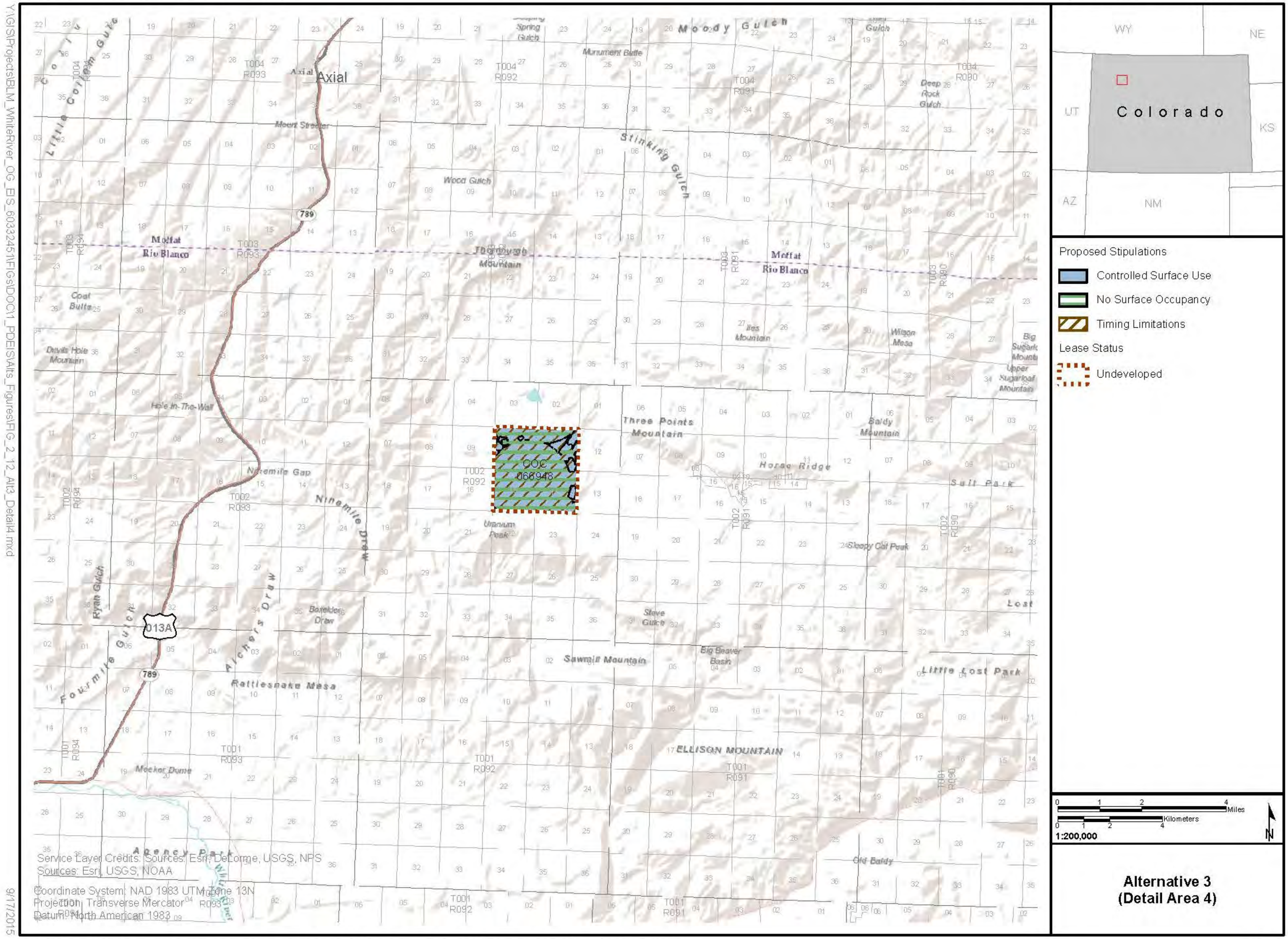

Figure 2-12 Proposed Lease Stipulations under Alternative 3, North Side

2.3.4 Alternative 4 (Proposed Action): Modify Stipulations and Cancel Leases to Match the WRNF 2014 ROD

Under Alternative 4, the BLM would modify existing lease stipulations in areas identified as open to future leasing by the Forest Service and cancel existing leases in areas identified as closed to future leasing in the WRNF Draft ROD (USFS 2014b). Although the Forest Service's decision on future leasing in the 2014 ROD does not apply to the 65 previously issued leases, this alternative is designed to reflect the Forest Service's future management objectives for these lease areas. The primary difference between Alternatives 3 and 4 is that under Alternative 4, some leases or parts of leases would be cancelled to match the Forest Service draft decision for future leasing availability in the WRNF Draft ROD (USFS 2014b). In the existing leases identified as open to future leasing in the WRNF Draft ROD, the stipulations would be modified to be the same as those listed for Alternative 3 in **Table 2-3**. Lease Notice CO-56 would apply to new development under Alternative 4.

In the areas identified as closed to future leasing in the WRNF Draft ROD (USFS 2014b), one of two things would happen—the leases that sit entirely within areas designated as closed to future leasing would be cancelled, or leases that sit partially within and partially outside of areas closed to future leasing would be contracted (reduced in size) to the area of the lease that overlaps the part of the WRNF open to future leasing. With respect to the leases eligible to be contracted, the BLM would offer the lessee the option of either accepting the new lease terms or having the lease cancelled. For undeveloped leases within areas closed to leasing, cancellation would be done through a BLM administrative process and would require that the BLM refund any bonus bids and lease payments. For developed leases within areas closed to leasing, the BLM would pursue the plugging and abandonment of all wells and the removal of all associated ancillary facilities located in areas identified as NSO. As with the other alternatives, a decision to implement this alternative would not authorize any on-the-ground activities, including specific reclamation actions. If this alternative is selected, additional site-specific analysis would be required where surface-disturbing activities would be required.

Changes in lease stipulations under this Alternative would not apply to locations with producing wells because lease stipulations apply to exploration and development, not operations; however, any new wells to be developed on a lease with modified stipulations would be required to comply with those changes. The 25 leases that would be cancelled (all or part) are listed in **Table 2-4** and displayed on **Figure 2-13**.

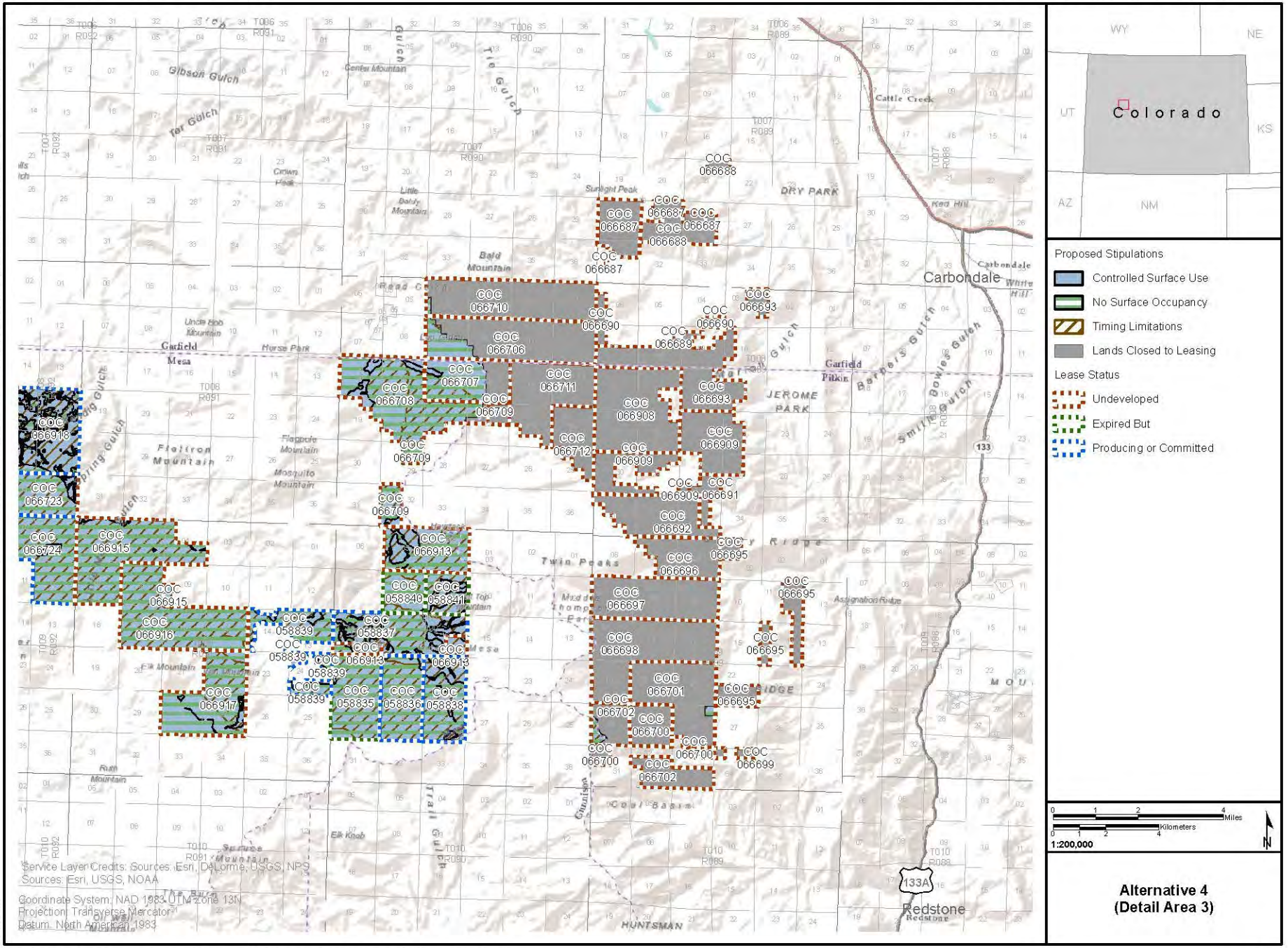

Figure 2-13 Leases to be Cancelled under Alternative 4

Table 2-4 Lease Acreage to be Cancelled Under Alternative 4 (all in Zone 3)

Lease No.	Lease Acres	Acres to be Cancelled	% of Lease to be Cancelled	Acres Retained (for Contracted Leases)
066687	1,053	1,049	All	0
066688	774	771	All	0
066689	40	40	All	0
066690	274	274	All	0
066691	198	197	All	0
066692	1,417	1,417	All	0
066693	2,167	2,153	All	0
066694	119	119	All	0
066695	1,061	1,052	All	0
066696	1,027	1,027	All	0
066697	1,872	1,872	All	0
066698	2,460	2,460	All	0
066699	114	111	All	0
066700	841	826	98.2%	15
066701	1,885	1,845	All	0
066702	1,254	1,160	92.5%	94
066706	2,548	2,093	82.1%	455
066707	1,276	380	29.8%	896
066708	2,554	79	3.1%	2,475
066709	638	160	25.1%	478
066710	2,329	2,293	98.5%	36
066711	1,751	1,751	All	0
066712	875	875	All	0
066908	2,400	2,397	All	0
066909	2,077	2,061	All	0

2.3.5 Alternative 5: Cancel All Leases

Under Alternative 5, all of the previously issued 65 leases would be cancelled. For producing leases, this action is not within the BLM's sole authority to implement so it would be necessary to pursue judicial action. For the purposes of analysis, it is assumed that this judicial action would result in the cancellation of all leases. This alternative is included mainly to facilitate a full range of analysis from continuing the existing leases with their current stipulations to considering a scenario as close to not having issued leases (following the WRNF 1993 ROD) as is feasible today. Under this alternative, all producing wells would have to be plugged and abandoned, infrastructure would be removed, roads, well pads, and other ancillary facilities would be reclaimed, and all disturbed areas would be revegetated. As with the other alternatives, a decision to implement this alternative would not authorize any on-the-ground activities, including specific reclamation actions. If this alternative is selected, additional site-specific analysis would be required. **Figures 2-14** and **2-15** display the locations of the producing wells and well pads to be removed.

Under this alternative, the following actions would be required:

- Plugging and abandonment of 75 wells; removal of all ancillary equipment (tanks, burners, etc.);
- Reclamation and revegetation of 16 well pads totaling approximately 38 acres; and
- Reclamation and revegetation of approximately 48 acres of access roads.

2.4 Alternatives Considered but Eliminated from Detailed Study

During alternatives development, the BLM reviewed all alternatives or alternative elements suggested by the public during the scoping period. The range of alternatives to be analyzed in detail described in Section 2.2 addresses most of the scoping comments. Some suggested alternatives or alternative elements were considered during the alternatives development process but were eliminated from detailed analysis.

In general, the following reasons may be considered grounds for eliminating an alternative (BLM Handbook H-1790-1, 6.6.3):

- It is ineffective because it would not respond to the agency's purpose and need.
- It is technically or economically infeasible.
- It is inconsistent with the basic policy objectives for the management of the area.
- Its implementation is remote or speculative.
- It is substantially similar in design to an alternative that is analyzed in detail.
- It would have substantially similar effects to an alternative that is analyzed in detail.

Additionally, there were some suggestions, such as best management practices (BMPs), well design specifications, or other design features that were not incorporated into an action alternative because the BLM has determined they are either regulated by other agencies or are more appropriately considered during the Application for Permit to Drill (APD) process, after operators submit a site-specific plan of operations for evaluation.

Mitigation may be subsequently attached to all leases as Conditions of Approval (COAs). During the APD process, potential resource issues would be identified at the onsite review (see Section 1.2, Federal Leasing Process). The site-specific environmental analysis at the APD stage may identify mitigation measures to be attached to the approved permit as COAs.

The specific alternatives that were eliminated from detailed analysis are discussed below, along with the rationale for their elimination.

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Date: 9/17/2015

WHITE RIVER N.F.
COC 066948
T2N R.92W
WHITE RIVER F.O.
Inset Map Location is Approximately 40 Miles North of Main Map Extent.

Parachute
70
6
COLORADO RIVER VALLEY F.O.
Battlement Creek
Cache Creek
Beaver Creek
West Mamm Creek
Middle Mamm Creek

WELL PAD: 17M
4 WELLS
WELL PAD: M16W
6 WELLS
WELL PAD: J16W
2 WELLS
WELL PAD: Honea 19-05
1 WELL
WELL PAD: C28
1 WELL
WELL PAD: Johnson 05-07
2 WELLS

COC 067544
COC 070015
COC 067542
COC 066920
COC 075070
COC 061121
COC 070016
COC 067543
COC 070014
COC 067150
COC 067147
COC 070013

T.7S R.93W
T.8S R.93W
T.8S R.95W
T.8S R.96W

WHITE RIVER N.F.
GRAND MESA AND UNCOMPAHGRE AND GUNNISON N.F.
GRAND JUNCTION F.O.

COC 058677
COC 059630
COC 066731
COC 066728
COC 066727
COC 066729
COC 066730
COC 066733
COC 066732
COC 066926

T.8.5 R.94W
T.9.5 R.93W
T.9S R.95W
T.9S R.96W
T.9S R.94W
T.9S R.93W

GARFIELD COUNTY
MESA COUNTY

Collbran
330
Plateau Creek
Buzzard Creek
Vega Reservoir

Legend

Project Features

Lease Zones
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Lease Boundary
- Existing Well Pad

Boundaries
- USFS Administrative Boundary
- BLM Field Office Boundary
- County Boundary
- Township/Range
- Section
- Urban Area

Hydrology
- Stream/River
- Lake/Reservoir

Highways
- Interstate
- Highway

Surface Ownership
- Bureau of Land Management
- Bureau of Reclamation
- Local
- Private
- US Forest Service

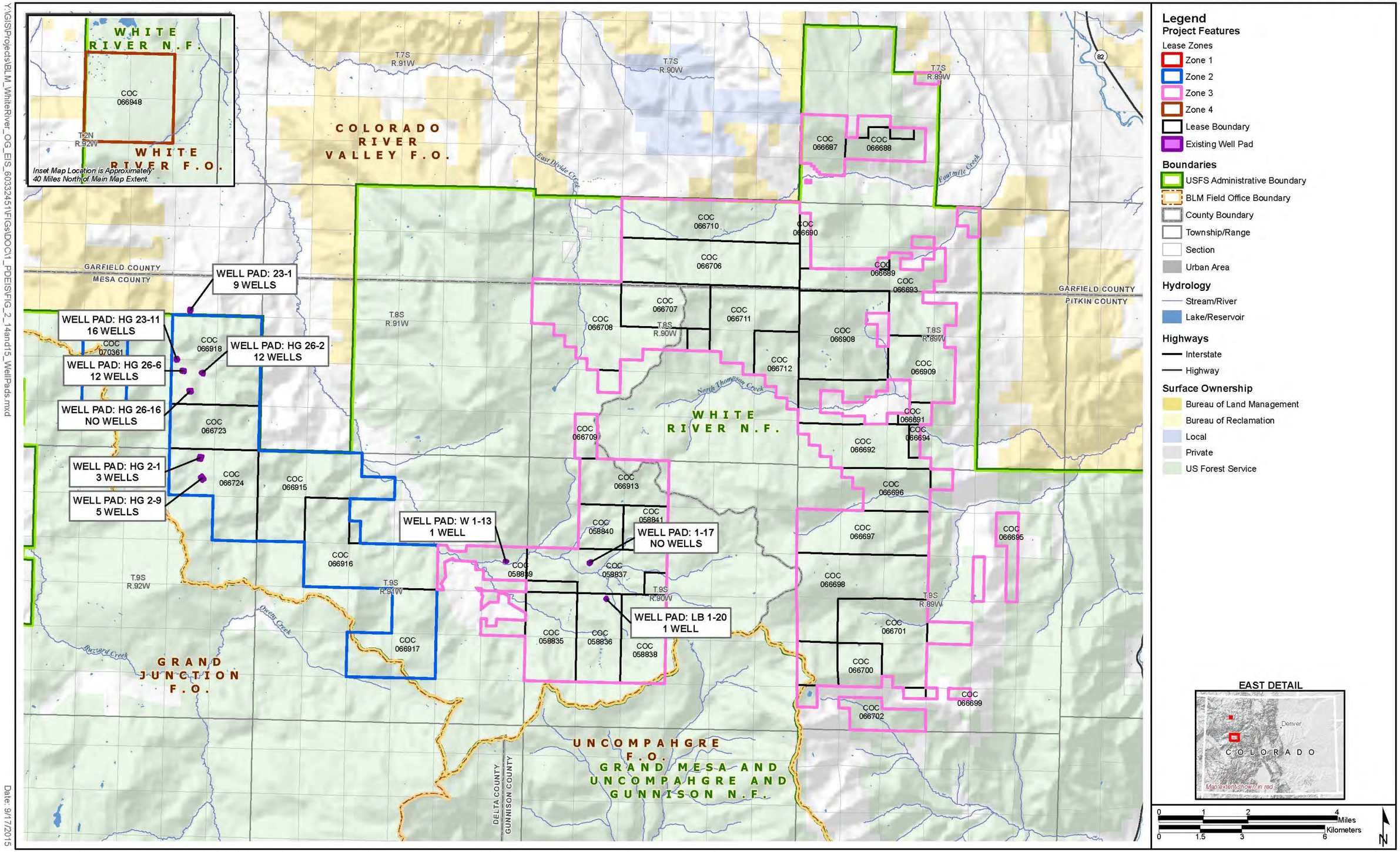
WEST DETAIL

0 1 2 4 Miles
0 1.5 3 6 Kilometers

N

Figure 2-14 Location of Existing Wells and Well Pads to be Removed Under Alternative 5, West side of Analysis Area

Y:\GIS\Projects\BLM_WhiteRiver_OG_EIS_6033245\1\FIGs\DOC\1_PDEIS\FIG_2_14and15_WellPads.mxd



Date: 9/17/2015

Figure 2-15 Location of Existing Wells and Well Pads to be Removed Under Alternative 5, East Side of Analysis Area

2.4.1 Designate Access Routes

Public scoping and some cooperating agency comments stated concerns related to the potential effects of traffic by vehicles and heavy equipment used by the oil and gas industry on community, residential, and relatively narrow forest roads. The comments pointed out that the roads and bridges, especially those that would be needed to access the eastern-most leases, are not adequate to handle heavy and frequent industry traffic without major improvements. Also of concern was that the heavy vehicle traffic would be incompatible with the other activities in Carbondale and Glenwood Springs, due to existing congestion during ski season and the residential nature of some of the feeder roads that would most likely be used to access the leases. Some commenters specifically expressed concern over the use of Four-Mile Road, which is the primary road that would be used to access the leases south of Carbondale and requested that use of this road by oil and gas vehicles and heavy equipment not be allowed.

Specifically, it was suggested that the BLM consider designating specific routes to access certain leases under one or more alternatives. This alternative was not carried forward because BLM guidelines and policy specify that lease stipulations are used to control on-lease activities, not otherwise lawful off-lease activities over which BLM has no authority. This alternative would not be consistent with the agency's purpose and need to comply with the BLM's and Forest Service's mineral policy and collaborative responsibility for oil and gas development. The construction, use, or improvement of roads on public lands must be addressed through analysis during a separate NEPA process for right-of-way (ROW) or special use permits. In addition, analysis of not using Four-Mile Road to access oil and gas leases would be covered under Alternatives 4 and 5, in which those leases would be cancelled.

2.4.2 Limit Hydraulic Fracturing

There were public concerns related to the effects of hydraulic fracturing expressed during scoping and recommendations that the BLM should consider limiting or excluding hydraulic fracturing through lease stipulations. The BLM determined that limiting or disallowing hydraulic fracturing is not feasible for three primary reasons:

1. There are appropriate mitigation measures required during well development operations to minimize potential adverse impacts;
2. Operators cannot feasibly develop many of the target formations in the 65 leases without hydraulic fracturing, which would result in denying access to the leased minerals; and
3. Hydraulic fracturing is speculative until the site-specific stage of permitting and therefore is not able to be analyzed in detail at the leasing stage.

2.4.3 Cancel All Leases in the Thompson Divide Area

There were many requests made during public scoping for the BLM to cancel all leases in the area known locally as the Thompson Divide. The reason stated for an alternative that cancels these leases is to preserve the current nature of the area, protect natural resources for recreational uses, protect surface water and groundwater, and preserve land values and residential communities.

The BLM considered creating an alternative in response to this public request. This was determined not to be necessary as a separate alternative to be analyzed in detail because it is substantively similar to Alternative 4, which reflects the decision made in the WRNF Draft ROD (USFS 2014b). The approach to analyzing Alternative 5 in which all leases would be cancelled would consider this option without creating and analyzing a separate alternative.

2.4.4 Reducing the Size of the Leases

Scoping comments suggested that the BLM consider reducing the size of the leases as a way to minimize resource impacts. This suggested alternative was eliminated from detailed analysis because it would have substantially similar effects to Alternatives 3 and 5. Alternative 3 adds large areas of new lease stipulations to minimize adverse effects to important resources. Where there are additional acres of NSO stipulations, the size of the lease is effectively reduced for surface disturbance, only allowing fluid mineral extraction from formations accessed from surface locations that are offset from the target location. Alternative 5 considers cancelling all leases, which would eliminate future development and resource impacts.

2.4.5 Cancelling Suspensions/Allowing Leases to Expire

Scoping comments suggested that the BLM should cancel all lease suspensions and allow leases to expire. This alternative element was dismissed from detailed analysis because it does not meet the agency's purpose and need to regulate the develop of oil and gas in the public domain as defined by the Mineral Leasing Act as amended and would be inconsistent with the requirement to address the NEPA deficiency identified by the Interior Board of Land Appeals (IBLA).

2.4.6 Requirements for Existing Pollution to be Cleaned Up before Leases are Developed

Scoping comments suggested that the BLM consider a requirement that existing pollution must be cleaned up before operators can develop their leases. This alternative was dismissed from detailed analysis because it does not meet the BLM's or the Forest Service's purpose and need. Specifically, it does not meet BLM's purpose and need to revisit or reaffirm previous leasing decisions, address the NEPA deficiency identified by the IBLA, or meet the BLM's collaborative responsibility under the Federal Onshore Oil and Gas Leasing Reform Act of 1987 to issue and manage oil and gas leases where the Forest Service has issued a land availability decision. Compliance with applicable laws, regulations, and standards for pollutants or hazardous materials and spills is required as part of the BLM and Forest Service regulations, policies, and guidelines for monitoring and enforcement of federal oil and gas leases (e.g., 43 CFR § 3162).

2.4.7 Requirements for Monitoring of Existing Sites

Scoping comments suggested that the BLM consider a requirement that existing development be randomly monitored to determine their performance with regard to atmospheric, water, and ground contamination. This alternative was dismissed from detailed analysis because it does not meet the agency's purpose and need to address the NEPA deficiency identified by the IBLA associated with the decision to lease. Monitoring of existing oil and gas leasing is addressed under the site-specific Environmental Assessments and permits that authorize development, and as part of the BLM and Forest Service policies and guidelines for monitoring and enforcement of federal leases. It is not within the scope of a leasing-level EIS.

2.4.8 Considering Drilling of Leases with NSO Stipulations from Adjacent Locations without NSO Stipulations

Scoping comments requested that the BLM and the Forest Service jointly consider and support the application of directional or horizontal drilling of federal leases designated with NSO stipulations from adjacent new or existing locations on federal leases without NSO stipulations or adjacent locations on private leases. This alternative element was dismissed from detailed analysis because BLM regulations and policy do not require specific drilling techniques such as horizontal drilling, which is a technical and economic decision to be made by the operator before submitting an APD. However, it should be noted that this scenario is assumed in some cases in the analysis of the alternatives carried forward.

2.4.9 Additional NSO Stipulations

Respondents requested the following NSO stipulations to protect resources that are not currently specified in the range of alternatives:

- NSO for cultural resources
- NSO for sensitive soils
- NSO stipulations to maintain road density guidelines
- NSO buffers around dams and water control structures
- NSO buffers around injection wells
- NSO within Inventoried Roadless Areas

It is important to note that the range of alternatives does offer the option of cancelling all leases. This alternative may be selected for any or all leases, particularly in which unacceptable adverse resource impacts are disclosed through analysis, including impacts to any resources that are not protected by the NSO stipulations outlined in the alternatives.

Additional reasons for the elimination of these alternatives are included below.

- Cultural Resources: The existing regulatory framework, including the National Historic Preservation Act, provides the authority to protect cultural resources. Protection of cultural resources is usually addressed at the site-specific APD stage, after cultural surveys have been done. The BLM and the Forest Service are required to consider avoidance or mitigation of sites eligible for the National Register of Historic Places and there is no need to incorporate a stipulation to protect a resource that is already protected by law.
- Sensitive Soils: Surface disturbance on erodible soils and landscape stability will be considered in the EIS impact analysis. The range of alternatives includes NSO and CSU stipulations to address conditions that can lead to loss or degradation of soil resources by disallowing surface disturbance (NSO) or moving surface disturbance away from erodible soils (CSU). These stipulations to protect soil resources would be applied under Alternative 3, following site-specific soil surveys once an APD is filed.
- Road Density: Because the locations of future oil and gas development (including new access roads) are not known at this level of the leasing availability analysis, it is not practicable to apply NSO stipulations to areas that may potentially have conflicts with Forest Plan road density guidelines. During the site-specific NEPA process, which is done when an APD is submitted, Forest Plan road density guidelines will be a part of the analysis and design of the proposal.
- Inventoried Roadless Areas: These areas were designated by the Forest Service in 2001. It was suggested in public scoping and informal discussions that these areas should be limited with a NSO stipulation. This was eliminated from detailed analysis because these designations have been superseded by the 2012 Colorado Roadless Rule. Alternatives 3 and 4 incorporate current Forest Service leasing requirements for compliance with the 2012 Roadless Rule.

2.4.10 NSO Stipulation Buffers

Respondents suggested specific buffers to protect various resources with NSO stipulations. These suggestions were dismissed from detailed analysis because they fall within the range of alternatives to be analyzed, which includes a full range of resource protections including the buffers contained in the 1993 analysis (Alternatives 1 and 2), the buffers contained in the 2014 WRNF Final EIS (Alternatives 3 and 4). Additionally, the possibility of no leasing is presented and analyzed under Alternative 5 and is available to the BLM as a decision.

2.4.11 Additional Timing Limitations

Respondents requested a timing limitation that would prohibit in-channel stream disturbance during fish spawning, egg incubation, and fry emerging seasons. This was not incorporated because the current range of alternatives includes NSO stipulations for both native cutthroat trout habitat and water influence zones, which includes perennial streams.

2.4.12 Additional Resource Protections

Scoping commenters suggested numerous design features and BMPs for various resources including the following. These design features, mitigation measures, and BMPs are more appropriately considered during the APD process, after operators submit a site-specific plan of operations for evaluation. For this reason, they were not added as part of an alternative to be analyzed in detail.

- Well Design: design specifications related to well drilling, stimulation, production, and closure phases.
- Air Quality: air quality mitigation measures such as methane capture, or other control measures; requirements for air quality monitoring.
- Human Health and Safety: use of bear-proof trash containers to reduce wildlife-human conflicts; BMPs to reduce the threat of industry-caused fire, and requirements for emergency response plans.
- Visual Resources: BMPs to protect recreation uses in the area, such as locating disturbance and equipment to minimize visual detection, and painting equipment in neutral tones that match surrounding landscape.
- Transportation: BMPs outlining collaboration needs for transportation routes.
- Water Resources: requirements to minimize the number of road-stream crossings; BMPs to manage road drainage and erosion to avoid routing sediment to streams; requirements for water resources management plans; and requirements for use of recycling produced water in well drilling and stimulation.

2.4.13 More Expansive Definition of Alternative 2

BLM considered a preliminary version of Alternative 2 that would have included modifying the geographic application of stipulations currently attached to the 65 leases, or be attached based on the WRNF 1993 ROD, to match more current mapping of those resources. This alternative element was eliminated as redundant with Alternatives 3 and 4, which rely on contemporary mapping of various resources to establish stipulations that are protective of those resources.

The BLM also considered a preliminary version of Alternative 2 that would have included modifying the leases to add stipulations needed to ensure compliance with applicable laws and regulation. This alternative element was eliminated from detailed analysis because: 1) it was somewhat redundant with standard lease terms and conditions and supplemental authorities, which require compliance with applicable laws and regulations, and 2) it was not clear whether any stipulations would be needed to ensure compliance. Therefore, Alternative 2 was defined with a more limited scope to allow analysis of a broad range of alternatives to inform the BLM's eventual decision.

2.5 Land Use Plan Conformance and Consistency

The Forest Service is responsible for determining what National Forest System (NFS) lands are available for leasing and under what stipulations. It also regulates all surface-disturbing activities conducted during exploration and development of oil and gas leases. The BLM is responsible for issuing oil and gas leases and permits for subsurface development of all federal fluid minerals including those

underlying NFS lands. Conformance and consistency with Forest Service and BLM land use plans is discussed below

2.5.1 Forest Plan Consistency

The first leasing decision on the WRNF was made with the 1993 Leasing Final EIS, ROD and Amendment to the Forest Plan. The 1993 Oil and Gas Leasing ROD analyzed lands for leasing and made approximately 950,000 acres available for oil and gas leasing with approximately 417,000 acres of the total available actually readily leasable without any additional environmental analysis. The 65 leases under analysis in this EIS were authorized by the WRNF 1993 Oil and Gas Leasing ROD.

In 2002, the WRNF published its Land Resource Management Plan (LRMP) Revision (USFS 2002a) and accompanying Final EIS analysis. The 2002 LRMP adopted the 1993 White River National Forest Oil and Gas Leasing ROD without changes, except that certain areas were made unavailable for leasing due to wild and scenic river designations or were recommended for wilderness.

This EIS evaluates a range of stipulations for oil and gas leasing, all of which are consistent with the WRNF 1993 Oil and Gas Leasing ROD, the 2002 LRMP, or the 2014 WRNF Oil and Gas Leasing Draft ROD that updates the 2002 LRMP. Forest Plan consistency is compared to the alternatives analyzed in detail in this EIS in the summary below.

- Alternative 1: This alternative would continue managing the existing leases according to the decisions made in the 1993 WRNF Oil and Gas Leasing ROD. This alternative would not apply new lease stipulations, and would therefore be inconsistent with the 2002 LRMP.
- Alternative 2: This alternative would address inconsistencies in leasing stipulations or apply new lease stipulations not contained in the 2002 LRMP. Therefore, this alternative would be consistent with the 2002 LRMP. The BLM has the authority to add additional lease stipulations beyond those identified and confirmed by the Forest Service.
- Alternative 3: Under this alternative, new proposed lease stipulations considered under the Proposed Action in the 2014 WRNF Oil and Gas Leasing Final EIS would be applied to the existing leases for the purpose of protecting resources. This alternative would be consistent with the 2002 LRMP and the proposed changes to the Forest Plan per the 2014 WRNF Oil and Gas Leasing Draft ROD because it adds stipulations contained in the LRMP and the 2014 Final EIS did not address decisions on existing leasing.
- Alternative 4: Under this alternative, new proposed lease stipulations identified in the 2014 WRNF Oil and Gas Leasing Draft ROD would be applied to the existing leases for the purpose of protecting resources. Some of the 65 existing federal oil and gas leases on the WRNF would be cancelled within those areas identified as not available for future leasing. This alternative would not be in conformance with the availability decisions in the 2002 LRMP but would be consistent with BLM's authority not to offer the lease. The alternative would be consistent with the decisions in the 2014 WRNF Oil and Gas Leasing Draft ROD for future leasing although not required to have plan conformity.
- Alternative 5: This alternative would cancel all 65 existing federal oil and gas leases on the WRNF. This alternative would not be in conformance with the availability decisions in the 2002 LRMP but would allow for future consistency with the changes identified in the 2014 WRNF Oil and Gas Leasing Draft ROD because it would enable the 65 leases to be reissued according to the Forest Service decision in the future.

2.5.2 BLM Resource Management Plan Conformance

While responsibility for issuing and managing the 65 leases analyzed in this EIS resides primarily with the BLM Colorado River Valley (CRVFO) (with one lease to the north managed by the BLM White River

[WRFO]), the CRVFO and WRFO do not determine what NFS lands are available for leasing nor do they identify the stipulations under which lands will be leased. Therefore, any changes in lease stipulations or availability of lands for leasing on NFS lands would not require changes to the CRVFO or WRFO Resource Management Plans (RMPs).

An evaluation of BLM RMP conformance would be necessary if BLM lands were to be used to provide offsite access to leases. Offsite access, to be determined at the development stage for each lease during processing of APDs, could involve lands managed by the CRVFO, WRFO, as well as the Grand Junction and Uncompahgre FOs. Conformance with the RMPs for these FOs would be evaluated as needed when a site-specific plan of development is submitted to the BLM with details regarding lease access.

2.6 Management Requirements, Monitoring, and Environmental Protection Measures Common to all Alternatives

Table 1-1 includes a list of major laws and regulations that apply to the leasing and development of federal fluid minerals on the WRNF. There are additional federal laws, regulations, and policies that may apply depending on site-specific resources and conditions. To assist the reader in understanding the oil and gas development phases, regulations, onshore orders, and BMPs, additional information is available on the Forest Service website at http://www.fs.fed.us/geology/energyOil&Gas.html and on the BLM Colorado website at http://www.blm.gov/co/st/en/BLM_Programs/oilandgas.html. The application of these laws to future development under the Proposed Action and alternatives is assumed in the analysis contained in Chapter 4.0. Because this NEPA process will not result in the approval or authorization of any aspects of development or surface-disturbing activities, identifying design features, BMPs, and COAs to be selected for yet-to-be-identified future development and production projects is best suited for future site-specific environmental analysis when locations are known. See Section 1.4 for a complete description of the decisions to be informed by this EIS.

Future site-specific analysis would occur when there is a review of onsite resources and conditions after the operator submits a Surface Use Plan of Operation (SUPO) and APD for oil and gas exploration or development. The onsite review helps to determine the level of NEPA analysis required, such as a categorical exclusion, environmental assessment, or EIS, before a SUPO can be approved and a permit to drill is issued. The site-specific analysis would evaluate requests by operators to approve waivers, exceptions, or modifications of lease stipulations. Regardless of the level of NEPA analysis, the onsite review is used to determine what site and project specific design features, BMPs, mitigation measures, or COAs would be attached to the SUPO and permit to drill to minimize impacts and protect resources.

2.7 Development Assumptions for Use in Impact Analysis

The 2014 WRNF Oil and Gas Leasing EIS is a programmatic environmental analysis that considers conceptual or planning-level alternatives. For this EIS analyzing potential changes to the 65 previously issued leases, the Reasonably Foreseeable Development Scenario (RFDS) (USFS 2010a), described briefly in Chapter 1.0, Section 1.1.4 and included as Appendix F of the WRNF Oil and Gas Leasing Draft EIS (USFS 2012) was used to determine the amount of conceptual future development in order to compare potential impacts of the proposed leasing stipulations under each alternative.

The following sections provide a simplified description of the typical process by which a federal fluid mineral well on NFS land would be developed in this region following issuance of a lease. This information forms the basis for the development assumptions that are used in the Chapter 4.0 analysis and is followed by summary tables of projected well numbers, associated ancillary facilities, surface disturbance, and water demands by well type and alternative.

2.7.1 Typical Well Development Process

2.7.1.1 Application for Permit to Drill

Prior to the start of construction activities, the operator submits site-specific applications to the BLM such as Notice of Staking, APD accompanied by a SUPO, and ROW application, as necessary. The operator submits project survey information, including detailed construction plans, and stakes the location on the ground. Although the BLM or Forest Service is responsible for resource surveys, the operator typically engages an independent third-party contractor to complete the cultural resource, biological, and other surveys, and provides written reports to the BLM or Forest Service as required.

The BLM forwards the SUPO to the Forest Service for review and approval. The BLM completes a geologic and petroleum engineering review of the proposal. The Forest Service and the BLM perform onsite evaluations of surface resources and complete a NEPA analysis as part of the review process. During the APD process, the BLM and Forest Service will determine whether any ROW grants or special use permits are required. The agencies also will identify any BMPs, design features, and mitigation measures that are required to be constructed to protect surface resources and comply with laws and regulations.

Operations by a lessee or operator do not require a special use permit for activities overlying the federal lease being developed, or when the lease is part of a federal unit or communitization agreement. A ROW grant from the BLM or a special use permit from the Forest Service (depending on the surface land manager) is required for well pads, tank batteries, pipelines, powerlines, and access roads that occupy federally owned land outside the lease or unit boundary associated with the proposed oil and gas well.

Once the SUPO is approved and the permit to drill is issued, the operator begins construction of access roads, well pads, pipelines, powerlines, and other ancillary facilities prior to drilling the well. Before surface-disturbing activities start, the operator must obtain a bond to ensure compliance with all lease terms, COAs, and reclamation requirements.

2.7.1.2 Access Road and Well Pad Construction

Most new access roads would be constructed as laterals from existing roads. Should a new access road be needed, the operator would move construction equipment over existing roads to the point where the access road would begin. Moving equipment to the construction site, such as bulldozers, scrapers, graders, backhoes, and trenchers using trucks) would require transporting several truckloads over public and private roads.

Generally the shortest feasible route would be selected to minimize the distance and construction costs, but environmental factors or the landowner's preference may dictate a longer haul route. The amount of surface area needed for roads depends upon topography and the types of loads they would carry. New roads to be developed for well pads are assumed to require up to a 75-foot disturbance corridor to allow room for construction of both the road and pipeline. Following construction, the disturbed area is stabilized and reclaimed, leaving a 25-foot-wide roadway including side ditches. Roads must comply with the guidance in the Surface Operating Standards for Oil and Gas Exploration and Development (U.S. Department of Interior and U.S. Department of Agriculture 2007), commonly called the "Gold Book."

Well pads are usually constructed from the native sand/soil/rock materials present. Locations are leveled by balancing cut and fill areas. Heavy equipment is used to clear, level, and prepare the site of the well pad. In general, vertical and directional wells require smaller well pads than horizontal wells. The average disturbance footprint for well pads outlined in the RFDS would be 6 acres, assuming that more than one well is drilled from a single pad. The EIS analysis assumes an average of 7 wells would be drilled from each well pad for vertical and directional wells and 2 wells per pad for horizontal wells.

Following well drilling and completion activities (see below), operators would reduce the size of the average 6-acre well pads to the minimum working surface area needed for production facilities and future workovers while allowing for reshaping and stabilization of cut-and-fill slopes. Interim reclamation would be accomplished by grading, leveling, and seeding, as required in the permit to drill. Interim reclamation would reduce the disturbed area at each pad to approximately 3.5 acres.

2.7.1.3 Drilling

Once roads are constructed, the drilling rig and associated equipment would be moved to the location and erected. Moving a drilling rig may require 10 to 25 truckloads of equipment over public highways and private roads. Special transportation permits for oversize loads would need to be obtained from the Colorado Department of Transportation. Derrick heights vary depending on the depth or weight capacity of the rig, but when erected, these heights could range from 160 feet for rigs drilling directional wells to 195 feet for rigs drilling horizontal wells.

Water for drilling would be hauled to storage tanks onsite. Water sources are typically from wells or commercial water sources permitted by the Colorado State Engineer for the use of surface or subsurface water for drilling. When drilling commences, and as long as it progresses, water would be continually transported to the rig location. Roughly 6,000 barrels or 252,000 gallons of fresh water (0.77 acre-foot) would be required to drill a vertical or directional well to the depth of between 3,500 and 7,500 feet. Horizontal wells would require approximately 25,000 barrels or 1,050,000 gallons of fresh water (3.22 acre-feet). More water would be required if circulation is lost.

Once the rig is ready, the hole is drilled to the appropriate depth, at which point surface casing would be set and cemented. Surface casing is set to a depth greater than the deepest fresh water aquifer that could be reasonably developed. After the surface casing is set, a blowout preventer is attached to the top of the surface casing to control the release of subsurface fluids (oil, gas, and water) to the surface. Minimum standards and enforcement provisions for drilling operations are addressed in Onshore Order No. 2.

Drilling is usually accomplished with water or drilling fluids (“mud”) that aid the drilling of the wellbore to depths within about 1,000 feet of the prospective formation. Drilling is usually conducted using a closed-loop drilling system, in which freshwater-based mud is circulated by means of pump pressure from tanks down the drill pipe, through jets in the bit, and up the space between the wellbore and the drill pipe. As mud and cuttings come to the surface, the mud is augmented with fresh mud in the rig’s mud tanks and recirculated and reused continually in the drilling process while drill cuttings are removed from the mud system typically with centrifuges and shaker systems. Drill cuttings are typically stored in a bermed or trenched area on the pad sometimes augmented with drying agents to prevent runoff. Drilling mud may be oil-based (diesel or mineral oil) or synthetic (olefins or paraffins). Synthetic drilling mud is more biodegradable and less toxic than standard oil-based muds.

The duration of drilling operations on a given well can vary greatly depending on depth and conditions encountered while drilling. Drilling operations are continuous, 24 hours a day, 7 days a week, and are estimated to take approximately 10 days for vertical or directionally drilled wells and 60 days for horizontally drilled wells. Pickup trucks or cars are used for workers’ transportation to and from the drilling site.

2.7.1.4 Well Testing and Completion

Upon reaching target depth, a series of geophysical logging tools are run in the well to evaluate the potential resource and make a determination regarding the productive potential of the well. If oil or gas is not discovered in commercial quantities, the well is considered dry. The operator would then be required to follow BLM procedures to properly plug the dry hole and the drill site and access road would be rehabilitated in accordance with the stipulations attached to the APD and the plugging approval.

If the well will be completed as a producer, the drilling rig is moved off the site after the production casing is cemented. A smaller rig, called a completion rig, then is moved in and utilized for running casing identification logs, perforating, running down hole pumps, running production tubing in the wellbore, and setting the wellhead valves and controls. The rest of the fluid treatment and handling system is installed at this time, such as production and storage tanks, dehydrators, separators, measuring systems, sales meters, and flow lines. A typical cased wellbore consists of conductor pipe, surface casing, and production casing. The surface, intermediate, and production casing/cementing programs are designed to isolate and protect shallower formations and aquifers from the production stream and to minimize the potential for migration of fluids and pressure communication between formations.

After drilling and casing of the well, a completion program is typically initiated to improve resource recovery by increasing the rate and volume of hydrocarbons moving into the wellbore. These processes are known as well-stimulation treatments and include hydraulic fracturing (or “fracking”), acidizing, and other mechanical and chemical treatments, often used in combination. Hydraulic fracturing is a process used to maximize the extraction of underground resources by allowing the fluid minerals to move more freely from the rock pores to the production well. Fluids, commonly made up of water and chemical additives (e.g., recycled or fresh water, liquid carbon dioxide, sand, and chemical additives), are pumped into a geologic formation at high pressure during hydraulic fracturing. When the pressure exceeds the rock strength, the fluids open or enlarge fractures. After the fractures are created, a propping agent is pumped into the fractures to keep them from closing when the pumping pressure is released. After fracturing is completed, up to 80 percent of the injected fracturing fluid returns to the wellbore. The specific type and components of the hydraulic fracturing fluid vary based on geologic formation and company. In Colorado, operators are required by the Colorado Oil and Gas Conservation Commission (COGCC) to maintain a list of the chemicals used in hydraulic fracture of each well and to submit that information to an online data repository (www.fracfocus.org).

Groundwater is protected during the hydraulic fracturing process by a combination of the casing and cement that is installed when the well is drilled and by the depth of the rock between the fracture zone and any fresh-water bearing zones or aquifers. Generally, for a typical Mesa Verde well (common to this analysis area), approximately eight hydraulic fracturing stages are performed for each well to free up gas in tight sand lenses.

After completion operations are finished, wellhead equipment, consisting of various valves and pressure regulators, is installed to control the oil or gas flow to the production facilities and to safely shut in the well under any conditions.

Completion activities are continuous, 24 hours a day, 7 days a week, and are estimated to take approximately 20 days for vertical or directionally drilled wells and 30 days for horizontally drilled wells.

2.7.1.5 Well Production

During production, employees of the operator visit the wells on an as-needed basis, estimated to be about twice per week per pad, to inspect well site facilities and perform other routine maintenance activities on a year-round basis. Field operations also are inspected by the BLM and Forest Service to ensure accountability for royalties, compliance with the lease, and compliance with permits, safety, and environmental requirements.

Produced water and liquid condensate is disposed of by trucking or piping the water to an authorized disposal area and treated. Produced water may be utilized in hydraulic fracturing operations after undergoing a treatment or disposed in an authorized disposal well. The COGCC controls all aspects of disposal wells. The BLM authorizes produced water from federal wells to be disposed of in an approved disposal facility.

It is estimated that when the field is mature each vertical or directionally drilled well would produce approximately 38,000 barrels of fluids (water and condensate) over the life of the well and that each horizontally drilled well would produce approximately 75,000 barrels of fluids (water and condensate) over the life of the well.

2.7.1.6 Well Abandonment and Reclamation

It is expected that the typical well would remain economically productive for approximately 20 to 30 years. When the well is depleted and can no longer produce in paying quantities, the operator would submit a plug and abandonment plan. Abandonment of the well pads and facilities would be performed in accordance with all applicable COGCC, Forest Service, and BLM regulations. Subsurface pipelines would be decommissioned from service, plugged at specific intervals, and abandoned in place. The well pad and access road would be closed, graded to natural contours, and reclaimed according to Forest Service specifications from the SUPO and applicable COAs.

The Forest Service would be responsible for establishing and approving the methods for surface rehabilitation, and determining when this rehabilitation has been satisfactorily accomplished. When surface reclamation is completed and desirable vegetation successfully established, the operator would submit a Final Abandonment Notice. When all wells on a lease are satisfactorily reclaimed, the bond would be released.

2.7.2 Differences between Vertical or Directionally Drilled and Horizontally Drilled Wells

The RFDS for the analysis area assumes development of the Mesa Verde Formation primarily by the use of conventional vertical or directionally drilled wells. Directionally drilled wells usually begin as vertical wellbores. At a designated depth (the “kickoff point,”) the wellbore trajectory bears off on an angle that is offset from the surface location to intersect the reservoir. They are often called “s-curve” wellbores to characterize a common configuration. Directional drilling may be used to minimize the wells' environmental impact because multiple wells may be drilled from one well pad, reducing the number of well pads and ancillary facilities and associated surface disturbance.

The objective of a directional well is to expose more reservoir rock to the wellbore surface than would be the case with a vertical well penetrating the reservoir perpendicular to the well casing. The initial portion of a directionally drilled well is typically drilled using the same rotary drilling technique that is used to drill most vertical wells.

Horizontal drilling typically starts out with a vertical wellbore until it reaches the target formation, then is turned horizontally at depth. Horizontal drilling offers the following differences from a vertical or directional well.

- A horizontal well may produce at rates several times greater than a vertical well, due to the increased wellbore surface area within the producing formation.
- Operators are able to develop a reservoir with a sufficiently smaller number of horizontal wells because each well can drain a larger rock volume about its bore than a vertical well.
- Horizontal wells take longer to drill and complete, use larger well pads for different drilling rigs, require more water for drilling and completion, and often generate more produced water.

2.7.3 Development Assumptions

Table 2-5 displays the assumptions for surface disturbance, water use, and production forecasts by type for a typical well in the analysis area, depending on the drilling technology. The table and the projections for development of the 65 existing leases assume all wells would produce gas with small amounts of oil. For this reason, no production of oil is listed. **Table 2-5** also shows the projected surface disturbance,

water usage, and mineral production based on the RFDS, assuming that the leases would be unconstrained by more than standard lease terms.

Initial surface disturbance refers to bare soils resulting from earthmoving activities until interim reclamation is achieved. Long-term surface disturbance refers to unvegetated surface that remains in that condition until final reclamation is completed. For example, during well pad construction, up to 6 acres would be disturbed (short-term) and it is assumed that 2.5 acres would be graded and revegetated, leaving 3.5 acres of long-term surface disturbance.

Table 2-6 lists other assumptions for typical wells. The assumptions shown in **Tables 2-5** and **2-6** are used in the impact analysis contained in Chapter 4.0.

Table 2-5 Surface Disturbance, Water Use, Production by Typical Well Type

Facility/Resource	Vertical/Directional				Horizontal			
			RFDS (Unconstrained)				RFDS (Unconstrained)	
Number of wells			427				17	
Number of pads			61				2.4	
	Per Well Rate		Total Amount[1]		Per Well Rate		Total Amount[1]	
Surface Disturbance (acres)	Initial	Long-term	Initial	Long-term	Initial	Long-term	Initial	Long-term
Pad size per well	0.9	0.5	366	214	0.9	0.5	14.6	8.5
Roads/Pipeline per pad	9.0	3.0	549	183	9.0	3.0	21.9	7.3
Water Use (acre-feet)								
Drilling (fresh)	0.77		330		3.22		55	
Completion (Recycled)	6.44		2,752		77.3		1,314	
Fluid Production (Life of Well)								
Gas (Bcf)	1.2		512		6.4		109	
Produced Water (acre-feet)	4.9		2,1		9.7		164	

[1] Due to rounding of decimal places, the total amounts shown may vary from a calculation using the numbers displayed for the per well rates.

Bcf = Billion Cubic Feet

Table 2-6 Other Development Assumptions for Typical Wells

Category	Activity	Vertical or Directional Well	Horizontal Well
Surface disturbance	Road and pipeline disturbance (initial)	1 mile @ 75 ft. wide (initial); 1 mile @ 25 ft. wide (long-term)	
Drilling practice	Wells per pad	7 per pad	2 per pad
	Drilling Duration	10 days	60 days
	Completion Duration	20 days	30 days
	Specific practices	Closed loop, green completions	Closed loop, green completions, synthetic mud
	Directional Reach (depends on total vertical depth)	1,000 to 5,000 ft.	10,560 ft.
Transportation (trips per well pad)	**Total for Drilling[1]**	**266**	**916**
	Over-Legal Trucks	7	14
	Heavy Trucks	86	281
	Light Trucks	172	621
	Total for Completion[2]	**376**	**497**
	Over-Legal Trucks	1	1
	Heavy Trucks	241	294
	Light Trucks	134	202
	Daily for Operations/Maintenance[3]	10 trips per day	10 trips per day
	Over-Legal Trucks	0 (workover only)[4]	0 (workover only)[4]
	Heavy Trucks	4	4
	Light Trucks	6	6
	Total for Reclamation [5]	**54**	**53**
	Over-Legal Trucks	2	2
	Heavy Trucks	10	10
	Light Trucks	41	41
Staffing	Employees Per Day	55	55

[1] Drilling estimates include road, pad and pipeline construction, drilling rig up/rig down, and drilling phases.

[2] Completion estimates include mobilization and completion phases.

[3] Operations include ongoing production and workovers.

[4] Over-legal trucks are estimated to be used during workovers only (which would occur every 4 years, and up to 10 days per well).

[5] Reclamation estimates include plugging and abandoning g the well and reclaiming roads and pads.

Source: Mobley 2014.

2.7.4 Well Numbers Under Each Alternative

The numbers of wells predicted to be developed under each alternative was determined by starting with the unconstrained development from the RFDS, shown in **Table 2-5**; prorating the well numbers projected for each zone based on past development numbers, production potential, and anticipated drilling technology; and considering the constraints on development, such as NSO stipulations and the maximum distance from the surface location to the target formation. **Table 2-7** displays the estimated number of new wells and pads that are used as the basis for the analysis of effects in Chapter 4.0. Because the number of wells and pads are prorated based on scaling the RFDS projections but the actual numbers and locations of wells and pads is unknown for this leasing analysis, there are fractional numbers for wells and pads only to be used for the analysis of impacts. **Appendix D** describes the process for scaling the RFDS projections for each alternative in more detail.

Table 2-7 Number of Projected Wells by Alternative

Zone/Well Type	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5 [1]
Zone 1					
Vertical/Directional Wells	19.7	19.7	19.7	19.7	0
Horizontal wells	16	16	16	16	
Pads	5.1	5.1	5.1	5.1	0
Zone 2					
Vertical/Directional Wells	318.1	318.1	318.1	318.1	-73
Horizontal wells	1	1	1	1	
Pads	45.6	45.6	45.6	45.6	-13
Zone 3					
Vertical/Directional Wells	50.7	50.7	47.6	17.9	-2
Horizontal wells	1	1	1	0.4	
Pads	7.4	7.4	6.9	2.6	-3
Zone 4					
Vertical/Directional Wells	10	10	10	10	0
Horizontal wells	0	0	0	0	
Pads	1.4	1.4	1.4	1.4	0
Totals					
Vertical/Directional Wells	398.4	398.4	395.4	365.7	-75
Horizontal wells	18	18	18	17.4	
Pads	59.5	59.5	59.1	54.7	-16

[1] Under Alternative 5 all leases would be cancelled; therefore, the number of new wells in all zones would be zero. This column displays the numbers of wells and pads to be reclaimed under Alternative 5.

2.7.5 Comparison of Alternatives

Table 2-8 displays, by alternative, projected surface disturbance (for well pads, roads, and pipelines), as well as projected water use, transportation needs, staffing requirements, and production forecasts for reasonably foreseeable development. The totals shown in the table account for the combination of vertical/directional wells and the number of horizontal wells projected under each alternative. These results are used in the analysis contained in Chapter 4.0.

Table 2-8 Development Assumptions by Alternatives

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5 [1]
Zone 1 (10,114 acres)					
Initial Surface Disturbance (acres)	77	77	77	77	0
Long-term Surface Disturbance (acres)	33	33	33	33	0
Fresh Water Use [2] (acre-feet)	339	339	339	339	0
Recycled Water Use (acre-feet)	1,091	1,091	1,091	1,091	0
Gas Production (Bcf)	126	126	126	126	0
Produced Water (gallons)	81,761,565	81,761,565	81,761,565	81,761,565	0
Zone 2 (24,938 acres)					
Initial Surface Disturbance (acres)	684	684	684	684	76
Long-term Surface Disturbance (acres)	296	296	296	296	0
Fresh Water Use [2] (acre-feet)	675	675	675	675	0
Recycled Water Use (acre-feet)	1,702	1,702	1,702	1,702	0
Gas Production (Bcf)	388	388	388	388	0
Produced Water (gallons)	510,837,600	510,837,600	510,837,600	510,837,600	0
Zone 3 (42,767 acres)					
Initial Surface Disturbance (acres)	111	111	104	39	10
Long-term Surface Disturbance (acres)	48	48	45	17	0
Fresh Water Use [2] (acre-feet)	123	123	117	44	0
Recycled Water Use (acre-feet)	323	323	307	115	0
Gas Production (Bcf)	67	67	64	24	0
Produced Water (gallons)	84,067,200	84,067,200	79,119,600	29,713,855	0
Zone 4 (2,562 acres)					
Initial Surface Disturbance (acres)	21	21	21	21	0

Table 2-8 Development Assumptions by Alternatives

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5 [1]
Long-term Surface Disturbance (acres)	9	9	9	9	0
Fresh Water Use [2] (acre-feet)	21	21	21	21	0
Recycled Water Use (acre-feet)	52	52	52	52	0
Gas Production (Bcf)	12	12	12	12	0
Produced Water (gallons)	15,960,000	15,960,000	15,960,000	15,960,000	0
Totals (80,361 acres)					
Initial Surface Disturbance (acres)	893	893	886	821	86
Long-term Surface Disturbance (acres)	386	386	383	355	0
Fresh Water Use [2] (acre-feet)	1,158	1,158	1,152	1,079	0
Recycled Water Use (acre-feet)	3,168	3,168	3,152	2,960	0
Gas Production (Bcf)	593	593	590	550	0
Produced Water (gallons)	692,626,365	692,626,365	687,678,765	638,273,020	0

[1] Under Alternative 5, all leases would be cancelled; therefore the number of new well in all zones would be zero. The Alternative 5 column displays the surface disturbance due to reclamation of existing wells, pads, and roads.

[2] Includes 20% of completion water (for hydraulic fracturing) that is not recycled.

Note: Assumptions used to calculate this information are derived from **Tables 2-5**, **2-6**, and **2-7**.

2.8 Summary of Impacts by Alternative

Table 2-9 provides a summary of the key direct and indirect environmental impacts for each resource analyzed under each alternative. Detailed descriptions of impacts are presented in each resource section in Chapter 4.0. The summarized impacts assume the implementation of laws, regulations, and environmental protection measures required by permits and policy.

Table 2-9 Summary of Environmental Impacts and Resource Protections

Resource Affected	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Air Quality	Based on the Comprehensive Air Resources Protection Protocol implemented by the BLM, the air quality modeling has been completed for this region through the Colorado Air Resources Management Modeling Study (CARMMS). Emissions from projected future development in the 65 leases were previously analyzed in a regional NEPA analysis (CARMMS) and determined not to contribute significantly to adverse effects on air quality. Disclosure of emissions inventories at the project level and monitoring would be required during development and production.				No further analysis or monitoring of air quality would be required under this alternative.
Geologic Hazards	CSU and NSO stipulations for steep slopes and geological hazards would provide limited coverage to unstable areas.	Coverage of unstable sites from stipulations would be similar to Alternative 1, with slightly more acreage of NSO in Zone 3.	The only stipulations that would minimize impacts to lands with geologic hazards are those designed to protect steep slopes. While this includes slightly more acreage of stipulations intended to cover these unstable areas, the greater limitations on development of lands with geologic hazards would result from NSO stipulations designed to protect other resources, should they be implemented.	Coverage of areas prone to geologic hazards would be similar to that described for Alternative 3. The exception is that those leases that would be cancelled in Zone 3 would not be developed so geologic hazards in the area that would be closed to leasing would not be disturbed by mineral development.	Reclamation of existing wells and other infrastructure would not increase geologic hazards or disturb unstable slopes.
Minerals	Estimated total production of 593 Bcf, approximately 28 Bcf less than projected for by the unconstrained RFDS.	Same projected gas production as Alternative 1.	Estimated total production of 590 Bcf, slightly less than Alternative 1.	Estimated total production of 550 Bcf, less than Alternative 1.	There would be an estimated loss of 45 Bcf gas production from the 75 producing wells.
Paleontological Resources	There are no stipulations designed to minimize impacts to important paleontological deposits. Protection of Potential Fossil Yield Classification Class 3 and 5 formations would result from implementation of NSO stipulations for other resources, if implemented, and the required management of those classes.	Similar to Alternative 1.	CSU stipulations designed to minimize impacts to paleontological resources would effectively cover almost all of the lease area so important fossil-bearing formations potentially would be protected.	Coverage by stipulations would be similar to that described for Alternative 3, with either NSO stipulations or areas closed to leasing limiting or eliminating surface disturbance in most areas.	Decommissioning and reclamation would take place on previously disturbed ground, so adverse impacts to fossil-bearing formations is unlikely.
Soils	An NSO stipulation for Slopes >60% would preclude surface disturbance in water erodible soils in almost all of Zone 1, in	Same level of coverage by stipulations as described for Alternative 1.	Resource-specific NSO protection would preclude surface disturbance in fewer acres of water erodible soils as	The coverage by stipulations for water erodible soils would be similar to that described for Alternative 3, except in	Surface disturbance would be limited primarily to previously disturbed areas that would be reclaimed. Following

Table 2-9 Summary of Environmental Impacts and Resource Protections

Resource Affected	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
	about one-third in Zone 2 and minimally in Zones 2 and 4 (less than 2%). Other NSO stipulations would increase this coverage slightly (mostly in Zone 2).		compared to Alternative 1 (between 1% and 6% of water erodible soils by zone); however, CSU stipulations designed specifically to minimize adverse impacts to erodible soils on between 78% and 100% of water erodible soils, by zone with consideration of all NSOs, there would be additional coverage of erodible soils compared to Alternative 1, as surface disturbance would be precluded in between 86% and 100% of all water erodible soils, by zone.	Zone 3, where a large area would be closed to leasing. Lease cancellation would result in the elimination of some mineral development within Zone 3 and additional protection for erodible soils.	reclamation, the potential for surface disturbance would decrease greatly and soil productivity would improve.
Surface Water	There are no stipulations specifically designed to minimize adverse impacts to surface water resources under this alternative. General NSO stipulations for coverage of other resources would, if implemented, limit development of 23% of Colorado Source Water Assessment and Protection (CSWAP) areas, 9% of Local Source Water Protection Plans (SWPP); 11% of Outstanding Waters, 52% of impaired and monitored waters, and 23% of perennial streams. No stipulation coverage would be provided for COGCC Rule 317B areas.	Same as Alternative 1, except that 11% of the SWPP areas would be covered by general NSO stipulations.	There are two NSO stipulations specifically designed to minimize adverse impacts to surface water resources Resource-specific stipulations that limit surface disturbance would cover 7% of CSWAP areas, 89% of COGCC Rule 317B areas, 9% of SWPP areas, 99% of Outstanding Waters, and 100% of Impaired Waters and perennial streams. General NSO stipulations including those for other resources would cover up to 88% of the CSWAP areas, 92% of COGCC Rule 317B areas, 88% of the SWPP areas; 99% of the Outstanding Waters, , and 100% of perennial streams and impaired and monitored waters.	There are two NSO stipulations specifically designed to minimize adverse impacts to surface water resources. The combination of the resource-specific NSO lease stipulations and areas closed to leasing would cover 45% of CSWAP areas, 89% of COGCC Rule 317B areas, 98% of SWPP areas, 99% of Impaired Waters, and 100% of Outstanding Waters and perennial streams. General NSO stipulations including those for other resources and the areas closed to leasing would cover up to 93% of CSWAP areas, 92% of COGCC Rule 317B areas. 99% of the SWPP areas. and100 % of, Outstanding Waters, impaired and monitored waters, and	There would be no stipulations needed for protection of surface water resources. Surface disturbance from decommissioning and reclaiming existing wells and infrastructure would be temporary and surface water would be protected by implementation of mitigation measures until reclamation success occurs.

Table 2-9 Summary of Environmental Impacts and Resource Protections

Resource Affected	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
				perennial streams would be precluded from surface disturbance.	
Groundwater	There are no stipulations designed specifically to minimize impacts to groundwater resources under this alternative. Areas of high aquifer sensitivity in Zone 1 would have the most protection from NSO lease stipulations designed to cover other resources, should they be implemented.	Similar to Alternative 1, with slightly more coverage in Zone 3 due to increased acreage of NSO stipulations.	There are CSU stipulations designed to minimize adverse impacts to groundwater under Alternative 3. These stipulations, combined with the NSO stipulations intended to cover other resources, would provide more coverage of groundwater resources and aquifers compared to Alternative 1.	Similar to Alternative 3, with additional coverage of groundwater resources in the areas that would be closed to leasing.	Once reclamation is completed, this alternative would have the lowest potential to adversely affect groundwater resources because there would be no mineral development.
General Vegetation	NSO stipulation would be applied to riparian/wetland areas (on the GMUGNF), and TEPC Plant Species Populations and Habitats. There would be no resource-specific CSU stipulations. Resource-specific NSOs would cover less than 1% of general vegetation and riparian/wetland habitats (within Zone 3 only). With consideration of all NSO stipulations, stipulation coverage of vegetation by zone would be as follows: Zone 1, 100%; Zone 2,-30%; Zone 3, 8%; Zone 4, 3%.	Same as Alternative 1 except that in Zone 3, lease stipulations would cover an additional 1% of vegetation from surface disturbance.	Resource-specific NSOs (4) would preclude surface disturbance on between 12% (Zone 4) and 73% (Zone 1) of vegetation. Resource-specific CSU stipulations (3) would be applied to between 66% (Zone 3) and 100% (Zone 1) of vegetation. With consideration of all NSO stipulations, stipulation coverage of vegetation by zone would be as follows: Zone 1, 100%; Zone 2, 87%; Zone 3, 86%; Zone 4, 92%.	Similar to Alternative 3 except that 95% of Zone 3 would be precluded from development by a combination of NSO stipulation and lease cancellations.	Minimizes impact to vegetation cover because all surface disturbance would be associated with reclamation of vegetation cover.

Table 2-9 Summary of Environmental Impacts and Resource Protections

Resource Affected	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Riparian/Wetland Vegetation	The same percentages of protection applies to riparian/wetland areas as described for General Vegetation, except that within Zone 4, NSO protections would extend to only 1% of the riparian/wetland habitat.	Same as Alternative 1 except that in Zone 3, lease stipulations would cover an additional 1% of riparian/wetland habitat from surface disturbance.	NSO would be applied to Riparian/Wetland (GMUGNF), Fen Wetlands, and federally listed Plant Species Populations and Habitats. Riparian/wetland areas would have between 7% (Zone 2) and 83% (Zone 1) and 95% NSO stipulations coverage by zones; however, the resource-related WIZ NSO stipulation would offer between 63% (Zone 3) and 93% coverage.	Similar to Alternative 3 except that surface disturbance in over half of all riparian habitat in Zone 3 would be precluded through lease cancellation.	Minimal adverse impact to riparian/wetland areas because no new development would occur in these areas.
Special Status Plants	Federally listed species would be covered by an NSO stipulation, but this stipulation does not extend to suitable habitat. There is no DeBeque phacelia and Colorado Hookless Cactus suitable habit outside of Zone 1 so all suitable habitat for these species would be covered. Ute ladies'-tresses suitable habitat would not be covered by stipulations outside of Zone 1. The degree of coverage by stipulations for other special status species in Zones 2, 3, and 4 would vary by suitable habit type (0% to 100% for fen habitat, 3% to 47% for forested habitat and <1% to 34% for non-forested habitat). Significant plant communities would have very little coverage by stipulations in Zones 2, 3, and 4.	Same as Alternative 1.	CSU stipulations would be applied to Spruce-Fir Old Growth and Old Growth Recruitment Stands, and Plant Species of Local Concern, and Sensitive Plant Species. All federally listed suitable habitats would be fully covered. The degree of stipulation coverage for other special status species in Zones 2, 3, and 4 would vary would be between 60% and 100% depending on habitat type and zone. Significant plant communities would have between 68% and 100% coverage.	Similar to Alternative 3 except that surface disturbance in over half of all special status species habits habitat in Zone 3 would be precluded through lease cancellation.	Alternative 5 would minimize the potential for adverse impacts to special status species habitat to the greatest extent because all surface disturbance would be associated with reclamation.

Table 2-9 Summary of Environmental Impacts and Resource Protections

Resource Affected	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Terrestrial Wildlife	NSO stipulations would be applied to bighorn sheep and big game (elk and mule deer) winter ranges. TLs would be applied to big game winter range and elk production areas. A CSU would be applied elk production areas within the GMUGNF. The bighorn sheep NSO would cover most bighorn sheep habitat as currently mapped. The big game winter range NSO would cover mule deer winter range as currently mapped and would cover 8% of elk winter range in Zone 2. The TL stipulation for big game winter range would not always protect deer and elk winter range as it is currently mapped and would not be applied to moose. With regard to all NSO stipulations, the combined coverage of terrestrial wildlife habitat by zone would be as follows: Zone 1—100%, Zone 2—30%, Zone 3—8%, Zone 4—3% Outside of Zone 1, coverage of sensitive wildlife habitat from surface disturbance would be as follows: Mule deer would have no NSO stipulations. Elk production areas would have between 5% and 41% NSO stipulation coverage.	Similar to Alternative 1 with slightly more combined NSO protections for elk production areas, elk winter range.	The NSO stipulation for bighorn sheep would be expanded to include additional habitat types, resulting in 100% coverage of currently mapped habitat. The NSO stipulation for winter range would be eliminated. The big game winter range TL stipulation would be expanded to include moose and would cover most of deer, elk, and moose winter range as currently mapped. The TL stipulation for elk production areas would be eliminated. Although this stipulation would not be included on any of the leases under Alternatives 3 and 4, there is still an opportunity to apply a 60-day TL as a COA under the BLM Standard Lease Terms during site-specific NEPA analyses at the implementation level. However, implementing the TL stipulation for big game summer concentration areas (June 16-Octover 14) and not including the elk production TL under Alternatives 3 and 4, would result in a 45-day window (May 1 to June 15) that would leave approximately 23,813 acres (10% of the total range within the analysis area) of elk production areas on 39 leases in Zones 2, 3, and 4 (see **Table 3.7-4**) without stipulation	Coverage by stipulations would be similar to that described for Alternative 3. With regard to all NSO stipulations and areas closed to leasing, the combined coverage to minimize adverse effects on terrestrial wildlife habitat by zone would be the same as Alternative 3 with the exception of in Zone 3 where additional coverage of terrestrial wildlife habitat would be provided by the areas that would be closed to leasing. The leases that would be canceled due to the closed to leasing requirement would preclude surface in the following wildlife habitat in Zone 3: • 3 acres of mule deer habitat • 9,724 acres (72%) of elk production areas • 97 acres (17%) of all elk severe winter range • 1,902 acres (90%) of all elk winter range • 10,296 acres (57%) of all elk summer concentration areas • 241 acres (85%) of black bear fall concentration areas and 1 acre (1%) of all summer concentration areas	Alternative 5 would provide the maximum amount of reduction in adverse impacts due to oil and gas development for terrestrial wildlife resources.

Table 2-9 Summary of Environmental Impacts and Resource Protections

Resource Affected	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
	Elk winter range would have between 1% and 25% NSO coverage and elk severe winter range and elk winter concentration areas would have 0% to 6% NSO coverage. Elk summer concentration areas would have 50% NSO coverage within in Zone 2 but less than 5% in Zone 3. Moose habitats would have 2% to 12% NSO coverage. Black bear fall concentration areas would have 12% to 40% NSO coverage.		protection. CSUs would be applied to Big Game Migration Corridors, Big Game Production Areas, Big Game Summer Concentration, Big Game Winter Ranges, Elk Production Area (GMUGNF) and Sensitive Terrestrial/Avian/ Invertebrate Species. With regard to all NSO stipulations, the combined coverage of terrestrial wildlife habitat by zone would be as follows: Zone 1—100%, Zone 2—87%, Zone 3—86%, Zone 4—92%. Mule deer would have 70% to 100% NSO coverage by zone. Elk habitat would have between 63% and 100% NSO coverage, except for severe winter range in Zone 3, which would have no NSO coverage. Moose habitat would have between 80% and 99% NSO coverage in all zones. Black bear habitat concentration areas would have 57% to 100% NSO coverage by zone.		
Special Status Wildlife Species	All special status species would be covered by an NSO stipulation but this does not necessarily include occupied habitat. Lynx denning habitat would have 89% and 5% NSO coverage in Zones 2 and 3, respectively. The wetland/riparian stipulation for	Similar to Alternative 1 with slightly more combined NSO coverage for Canada lynx denning habitat.	Federally listed/candidate species and associated habitat would be fully covered.	Federally listed/candidate species and associated habitat would be fully covered. The leases that would be canceled due to the closed to leasing requirement would preclude surface in 105 acres of lynx denning habitat in	Federally listed/candidate species and associated habitat would not be affected by oil and gas development.

Table 2-9 Summary of Environmental Impacts and Resource Protections

Resource Affected	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
	GMUGNF would cover about 1% of associated western yellow-billed cuckoo riparian/wetland habitats in Zone 2. Sage grouse habitat (in Zone 1 only) would be fully covered by NSO stipulations.			Zone 3.	
Aquatic Resources	There are NSO and TL stipulations designed to minimize adverse impacts to cutthroat trout habitat that would cover up to 7 miles of perennial streams, mostly within Zone 3, with no coverage from resource-specific stipulations in Zones 1 and 4. Other NSO stipulations would cover some streams and habitat for aquatic species if implemented. This alternative would not fully cover special status aquatic species habitat (cutthroat trout, boreal toad, leopard frog) through stipulations. No new water depletions that have not been analyzed in the previous Biological Assessment and Biological Option are projected.	Same as Alternative 1.	Additional NSO, CSU, and TL stipulations designed for aquatic resources would cover approximately 44% of named perennial streams in Zone 2, 78% in Zone 3, and 100% in Zone 4. There are no perennial streams with game or special status aquatic species in Zone 1. There would be increased coverage for special status aquatic species habitat through resource-specific stipulations and other stipulations. No new water depletions that have not been analyzed in the previous BA and BO are projected.	Similar to Alternative 3, except that more perennial stream miles in Zone 3 outside the leases would be covered by being closed to leasing, eliminating future mineral development in those areas.	Following the short-term disturbance required to removed existing wells and other infrastructure and implement reclamation, there would be no potential impacts to aquatic resources from mineral development or water depletions.
Cultural Resources	There are no stipulations specifically developed to minimize adverse impacts to cultural resources, although federal law would provide coverage of eligible sites. It is estimated that approximately 276 archaeological sites would	There are no stipulations specifically developed to minimize adverse impacts to cultural resources, although federal law would provide coverage of eligible sites. It is estimated that approximately 281 archaeological sites would	There are no stipulations specifically developed to minimize adverse impacts to cultural resources, although federal law would provide coverage of eligible sites. It is estimated that approximately 670 archaeological sites would	There are no stipulations specifically developed to minimize adverse impacts to cultural resources, although federal law would provide coverage of eligible sites. It is estimated that approximately 707 archaeological sites	Surface disturbance to remove infrastructure and reclaim areas would occur primarily in previously disturbed areas. It is unlikely that any sites would be affected.

Table 2-9 Summary of Environmental Impacts and Resource Protections

Resource Affected	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
	be protected from surface disturbance, when considering all NSO stipulations, should they be implemented.	be protected from surface disturbance, when considering all NSO stipulations, should they be implemented.	be protected from surface disturbance, when considering all NSO stipulations, should they be implemented.	would be protected from surface disturbance, when considering all NSO stipulations, should they be implemented.	
Transportation	Future mineral development would result in new road construction and increased traffic levels proportionate to the amount of development projected in each zone (Zone 2 projected for the most development). Increased traffic levels to service gas wells would be most noticeable along roads in areas without high levels of existing development. An estimated 60 miles of new roads would be constructed, with the heaviest increase in traffic during drilling and completion of wells. An average of 8,449 daily vehicle round-trips, with potential for vehicle collisions and/or an increased risk of collision with wildlife.	Same as Alternative 1.	Slightly fewer wells to be developed but the projected level of traffic and new road construction would be similar to Alternative 1.	With fewer wells projected to be developed in Zone 3, this alternative would result in the fewest miles of new roads and the lowest increase in development-related traffic.	There would be vehicle traffic in Zones 2 and 3 to decommission wells, pads, and roads, and to reclaim the disturbed areas. Once the reclamation is complete, no development-related traffic or construction would occur.

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Resource Affected	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Land Use	Existing land uses would be affected where NSO stipulations do not restrict mineral development. In these areas, it is likely that new ROW authorizations would be necessary. NSO stipulations would be the least under Alternative 1, so changes in land use may be most affected. Communication sites would be covered by stipulations for other resources.	Same as Alternative 1.	Similar to Alternative 1, with more NSO stipulations that would minimize land use changes within the leases, possibly pushing mineral development off-lease to other landowners. The communications sites would be covered by a CSU stipulation.	Similar to Alternative 3, except there would be no land use changes in Zone 3 within the area identified as closed to leasing.	Land uses within the leases would not be modified by mineral development. The 75 wells and associated roads and pipelines would revert to previous land uses after reclamation is completed.
Special Designations	The special designations potentially affected include the Lower Battlement Resource Natural Areas (RNA) (Zone 1) and the roadless areas designated under the Colorado Roadless Area (CRA). The majority of the RNA would be covered by NSO stipulations designed to protect steep slopes and bighorn sheep habitat, should they be implemented. There would be limited coverage of CRAs through NSO stipulations intended to minimize impacts to other resources. There are no CRAs in Zone 4.	Same as Alternative 1.	There would be slightly more acreage of NSO stipulations to minimize adverse impacts to the RNA under Alternative 3 and more protection of CRAs through NSO stipulations, primarily in Zones 2 and 3. There are no CRAs in Zone 4.	Same as Alternative 3 when considering coverage from both NSO stipulations and designation of Zone 3 areas closed to leasing.	Alternative 5 would result in the fewest development-related impacts to the RNA and CRAs because all leases would be canceled.
Recreation	Should they be implemented, NSO stipulations created to minimize adverse impacts to other resources would limit development-related impacts by covering portions of backcountry motorized and non-motorized management	Similar to Alternative 1 with slightly more coverage of ROS classifications due to slightly increased NSO stipulation acreage.	More coverage of summer and winter ROS classifications would be provided by the greatly increased amount of lease stipulations, especially through NSO constraints. This would provide greater coverage for backcountry motorized	Protections of ROS classifications would be similar to Alternative 3.	Protection of recreation resources would be the greatest under Alternative 5 because all leases would be canceled so there would be no impacts to recreation once existing well pads and roads are reclaimed.

Table 2-9 Summary of Environmental Impacts and Resource Protections

Resource Affected	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
	areas in Zone 2. There would be limited acreage of summer and winter recreation opportunity spectrum (ROS) classifications coverage by lease stipulations compared to the acreage available for development.		recreation in the designated Management Area and the same amount of coverage to non-motorized areas in Zone 2. The dispersed recreation management area in Zone 3 would have some coverage under this alternative.		
Livestock Grazing	Should they be implemented, NSO and CSU stipulations designed to minimize adverse impacts to other resources would provide some coverage to forage within established grazing allotments that overlap leases. Approximately 25% of all allotments within the leases would be covered. Surface disturbance or the occurrence of structures related to mineral development would only affect an estimated 3 animal unit months on the leases over the long term. Off-lease surface disturbance also could occur.	Similar to Alternative 1, with slightly increased acreage of NSO stipulations that could provide additional coverage to forage.	Because all allotments that overlap the leases would be protected by NSO or CSU stipulations, it is estimated that this alternative would result in the least adverse effects to on-lease forage.	Similar to Alternative 3 with possibly greater off-lease coverage of forage within allotments due to the areas in Zone 3 that would be closed to leasing.	Under Alternative 5, areas within allotments would be reclaimed and no new development-related disturbance would occur. This would result in an increase in forage within allotments.
Scenic Resources	There are no specific stipulations to minimize adverse impacts to scenic resources under Alternative 1. Implementation of NSO stipulations designed to cover other resources would provide minor coverage to changes in scenic attractiveness, with the highest percentage of coverage of high and very high Scenic Integrity Objectives by other NSO stipulations in Zone 1.	Similar to Alternative 1.	Alternative 3 includes 3 stipulations designed to minimize adverse impacts to areas with high Scenic Integrity Objectives and travel routes that have high user concern. This coverage, combined with the large area of NSO stipulations designed to minimize adverse impacts to other resources, would result in fewer alterations of scenic resources within the lease boundaries.	Similar to Alternative 3, with additional coverage of scenic resources within the area that would be closed to leasing.	Alternative 5 would have the least adverse impact to scenic resources because, following decommissioning and reclamation of existing wells and other infrastructure, the area would be allowed to return to its natural condition.

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Resource Affected	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Hazardous Materials	Activities conducted under these alternatives carry risks of spills and releases of hazardous materials and solid waste. In the absence of stipulations, activities would be carried out in accordance with applicable regulatory programs.				The risks would be less under Alternative 5 because the hazardous materials and other chemicals used in gas production would not be present.
Human Health and Safety	No water resources-specific stipulations exist but the combined NSO stipulations could protect up to 12% of CSWAP areas, 10% of SWPPs. Impacts from air emissions are expected to be minimal. Risk of fire from construction activities or operation of gas wells would be addressed at the site-specific level through best management practices and well design. Limited employment increases are not expected to affect the level of emergency service. Development of 416 wells would result in county revenues that could benefit Public Safety.	General NSO stipulations related to other resources could minimize adverse impacts to portions of the CSWAP areas; all other impacts and risks would be the same as Alternative 1.	Public Water Supply Source Areas NSO stipulation would minimize adverse impacts to up to 69% of the CSWAP areas and 89% of the SWPP areas. Other potential impacts would be similar to Alternative 1 in type but the level of risk would be slightly less. County revenues that could benefit Public Safety also may be slightly reduced.	With the combination of NSO lease stipulations and areas closed to leasing, all designated CSWAP areas, and 99% of the SWPP areas would be precluded from surface disturbance. Potential impacts would be similar to Alternative 1 in type but the level of risk would be slightly less. County revenues that could benefit Public Safety also may be slightly reduced.	Long-term risks or potential impacts would be eliminated; some short-term risks would occur when the existing wells are plugged and abandoned and existing facilities reclaimed. County revenues that could benefit Public Safety would be eliminated.

Table 2-9 Summary of Environmental Impacts and Resource Protections

Resource Affected	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Socioeconomics	Most new wells are projected to be developed in Mesa County, which is projected to have the greatest increase in employment and revenue from gas development. In the Four-county Region, the following increases are projected due to future gas development: • 273 average annual total jobs • $17.3 million in average annual labor income • $79.0 million in average annual gas revenues • $5.7 million in average annual revenues to local government	Same as Alternative 1: • 273 average annual total jobs • $17.3 million in average annual labor income • $79.0 million in average annual gas revenues • $5.7 million in average annual revenues to local government	Slightly less increase in jobs and revenue compared to Alternative 1: • 271 average annual total jobs • $17.2 million in average annual labor income • $78.4 million in average annual gas revenues • $5.6 million in average annual revenues to local government	The average annual employment, labor income, and revenues to the Four-County Region would be less than Alternative 1 due to the decrease in wells projected to be developed and associated gas production. • 253 average annual total jobs • $16.0 million in average annual labor income • $72.7 million in average annual gas revenues • $5.4 million in average annual revenues to local government	Jobs, labor income, and revenue to counties would be the least under Alternative 5 because reasonably foreseeable future production would not be developed and producing wells would be eliminated. • 26 average annual total jobs lost • $1.3 million in average annual labor income loss • $18.8 million in average annual gas revenues lost • $1.4 million in average annual revenues to local government lost
Environmental Justice	There would be no adverse impacts to environmental justice populations under any alternative because they do not exist within the analysis area.				

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